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CHLORINATED OIL AND THE CHLORINE SUBSTITUTION IN FAT OILS.

By L. Wolff, M.D.

Read at the Pharmaceutical Meeting, May 16th.

The use of chlorine gas, in the form of chlorine water, in chronic affections of the skin, is by no means of recent origin, and already Thénard and Cluzel recommended the frequent immersion in chlorine water of the hands of those afflicted with itch, by which they claimed to have obtained most excellent and rapid results.

About fifteen years ago I had cause to try it, and had a most excellent success with it; though, to make its effect more lasting and emollient, I experimented with a liniment composed of equal parts of olive oil and chlorine water. The efficacy of this was not less potent, but the absence of any of the chracteristic odor of the gas in this liniment struck me as very peculiar, and I attributed it to a chemical change taking place. As a part of this latter would naturally have to result in the formation of hydrochloric acid, the question arises, if it is the latter or the chlorine gas which had combined with the oil that gave the beneficial results. As the free chlorine in the water, however, had proved effective, the inference is that the chlorine in combination with the oil had given the curative effect.

To test this matter, I was urged by my friend, Dr. J. V. Shoemaker, to make a chlorine compound with oil free from hydrochloric acid, which in the course of therapeutic experiments proved equally effective.

To prepare it I induced a stream of dry chlorine gas, generated in the usual way, into a quantity of oil equal to that of the water in making the chlorine water of the Pharmacopœia, but, to my surprise, found that I was unable to supersaturate the oil, as I had done with the water, no free chlorine becoming at any time evident, until after many days of experiment I ultimately succeeded in my purpose.

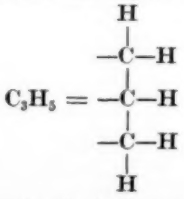
The oil so treated showed at first but little change, save that of turbidity, which could not have been due to water being present, as the gas had been well dried. It soon warmed and heated, and vapors of hydrochloric acid were then evolved. It had changed its color but little, grew viscid and of the specific gravity of 1·059. It is insoluble in alcohol, disproving the presence of free oleic acid; when washed with an equal bulk of water, to free from adherent hydrochloric acid, it showed an emulsifiant tendency. Dissolved therefrom with benzin, and the latter evaporated after previously filtering the solution, it left a product such as I here exhibit. Neutral to test paper at first, it grew acid at standing for some time, with well marked turbidity, thus proving the loosely molecular combination of the chlorine, which, being again substituted by hydroxyl, forms more hydrochloric acid. It possesses no marked odor, and certainly not that of chlorine, and varied in taste but little from that of ordinary oils, no irritant action being manifest when applied to the tissues.

An inquiry on this subject at our former meetings led me to investigate this matter more thoroughly, and I arrived at results which, from a chemical point of view, turned out very interesting.

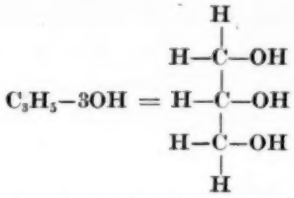
In order to understand the chemistry of this process it is necessary, however, to enter somewhat into the molecular position of the vegetable and animal oils and fats to show exactly where and how a chlorine substitution can take place.

Vegetable and animal oils consist in the main of two principles: one of them, forming on saponification, either with or without great heat or alkalies, is an alcohol named glycerin; the other, forming acids, are termed relatively stearic, palmitic and oleic acids, etc. The radicals of these two constituents are for the former termed propenyl or glyceryl, while for the latter they are known as stearyl, palmityl, and for that which forms the greatest part of the liquid and semi-liquid fats, oleyl.

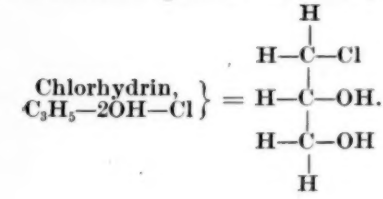
While the propenyl would be expressed as follows:

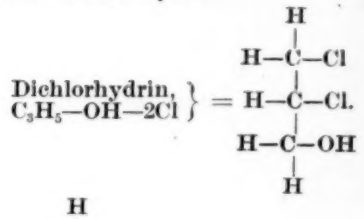


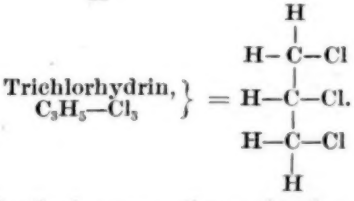
the glycerin or its triatomic alcohol would be constituted thus:



The three molecules of hydroxyl in the glycerin are easily substituted by several elements or compounds, such as acetic, benzoic, hydrochloric, hydrobromic and other acids; to illustrate this I give below the molecular position of mono-, di- and tri-chlorhydrins:





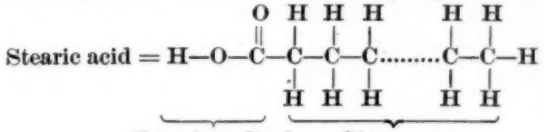


In the fats and oils, however, the molecules of hydroxyl of the glycerin are substituted by the radicals of the fatty acids, such as stearyl, palmityl and oleyl, producing ethers, as which fats and oils must be viewed, as for instance:

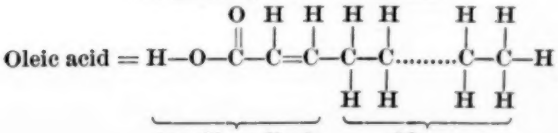
Stearins or Propenyl tristearyls = $C_3H_5.3(C_{18}H_{35}O_3)$

Oleins or Propenyl trioleyls = $C_3H_5.3(C_{18}H_{33}O_2)$

Again, as stearic, palmitic and oleic acids are acids derived from stearyl, palmityl and oleyl, and have an analogous constitution, the former belonging to the series of formic and the latter to that of acrylic acids, their relative constituents must be grouped as follows:

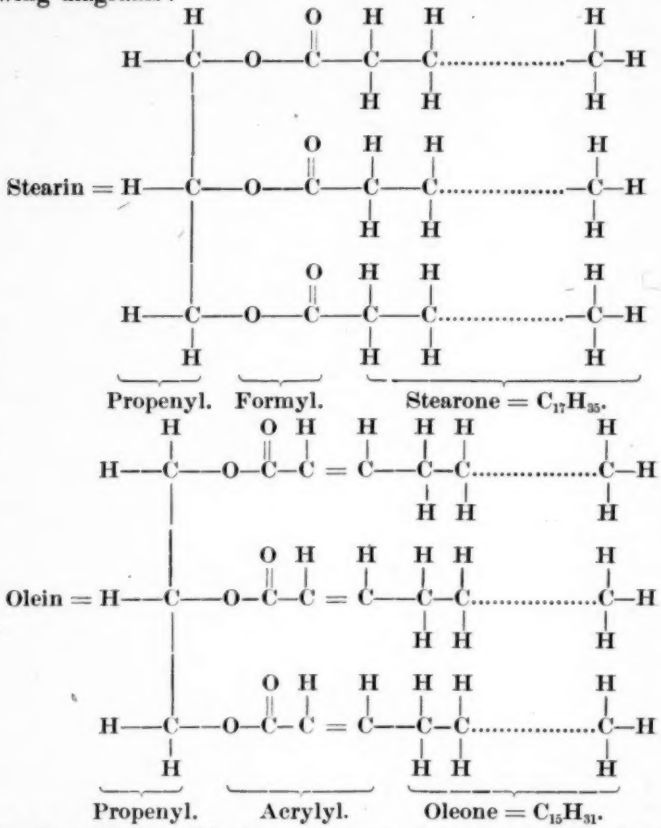


Formic radical. Stearone.

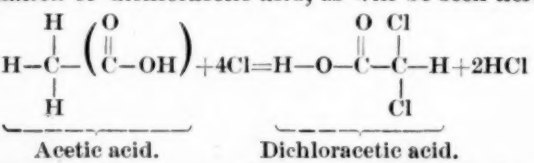


Acrylic radical. Oleone.

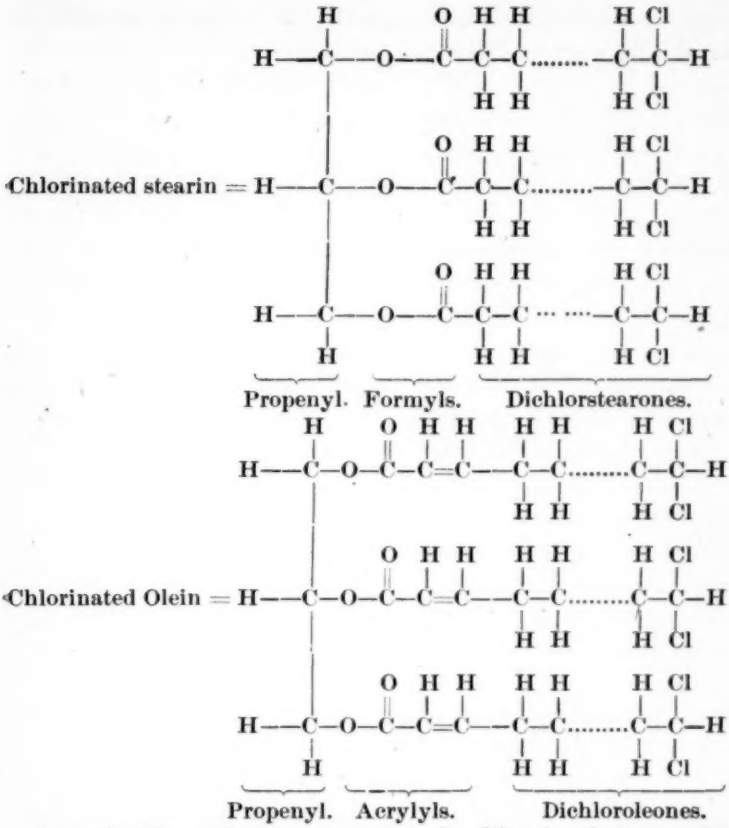
Thus the constitution of fats and oils will be represented by the following diagrams:



Therefore, if free chlorine gas comes in contact with these molecules, it cannot attack the propenyl, as this is really substituted by the stearyl and oleyl. Again, the stearyl and oleyl cannot be acted on by the chlorine in their acid nuclei, according to the analogy established by the formation of dichloracetic acid, as will be seen herein:

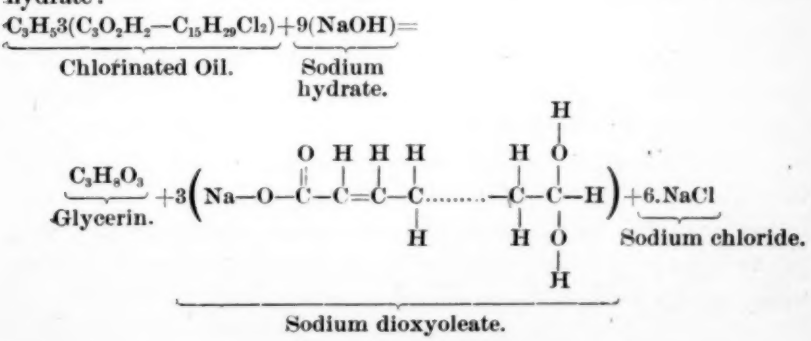


The chlorine must act, therefore, on the hydrocarbon appendices, $C_{17}H_{35}$ and $C_{15}H_{31}$, substituting therein the relative hydrogens by chlorine, resulting in a molecular position as shown below:



As palmitin and stearin are much alike in their constitution, a reproduction of the structural formula of the former is unnecessary.

As this chlorinated oil is saponifiable with boiling solutions of the hydrates of alkalies, yielding soap, glycerin and chlorides, I would give below a diagram illustrating its saponification with sodium hydrate:



The soap so produced, of which I here exhibit a specimen, manifests no material difference from ordinary soaps, only that in the course of its preparation it separates as it is formed, owing to the great amount of sodium chloride formed in the process.

The chlorinated oil, by computation of its atomic weight, shows 100 parts by weight to contain about 17·9 parts by weight of chlorine, or, in other words, it would take 48 parts by weight of chlorine gas to convert 100 parts of oil into the chlorinated product of which 24 parts by weight enter into the 100 parts of oil, and 24 parts form hydrochloric acid.

It would appear, hence, that in chlorinated oil we have not alone a very interesting chemical body, but one that is very rich in chlorine as well; and, as the latter exists therein in a loosely molecular condition, it will readily substitute itself again for hydroxyl, forming chlorine compounds with bodies of stronger affinity, and as such will prove probably of great therapeutic value wherever the use of chlorine, both as disinfectant and parasiticide, is indicated, and possibly presenting a proper antagonistic for bacteriæ, which are daily more shown to form the causation of many diseases.

Philadelphia, May, 1882.

ON BAY RUM OR BAY SPIRIT.

By A. H. Riise.

Read at the Pharmaceutical Meeting, May 16.

Bay rum is made by distillation of the leaves and berries of the bayberry tree with rum. Although bay rum is so much used in the United States, very little is known there about its origin, production, and the characters by which it is distinguished from imitations. A brief sketch of it will, therefore, be of interest to the druggist and importer as well as to the public in general.

The bayberry tree (*Pimenta acris*, W. A.; *Myrcia acris*, DC.) belongs to the large family of myrtaceæ, which abound in fragrant volatile oils. The plant is glabrous, of a considerable size, the stem is straight and rigid, the branchlets green and shapely four-angled, the leaves opposite, oval or roundish, shining, coriacious, from 3 to 5 inches long, with numerous parallel nerves, and sprinkled with many pellucid dots. The flowers are arranged in axillary panicles, and are white, with a reddish tinge. The berries are round, of the size of a

pea, two celled, and contain six to eight seeds. The leaves, and particularly the berries, are of a very aromatic odor. The tree flowers from June to August.

There exist many varieties of the bayberry tree throughout the West Indies, scarcely to be distinguished botanically, but with a quite different odor from that which the genuine tree has, and therefore great care must be taken in collecting the leaves which are to be used in the distilling of bay spirit, as the admixture of a small quantity of the other leaves may entirely spoil the product of distillation.

In the manufacture of distilled bay spirit only the true leaves are used, and they are not dried, but thrown fresh into the still, as experience has shown a great difference between the spirits distilled from good fresh and from dried leaves, the odor of the latter being materially altered by the necessary exposure to the sun and air in drying.

The leaves are mixed, in the still, with the ripe berries in a certain proportion. The ethereal oil of the berries having a much stronger aroma than that of the leaves alone, a bay rum distilled partly from the berries has, therefore, a much stronger odor, and keeps its flavor much longer than if distilled alone from the leaves, but the cost of the berries is also from fifteen to twenty times that of the leaves, since they can only be procured with great difficulty.

The rum used for the distillation must be selected with great care. It must be of the very best quality, perfectly pure, and without any foreign odor. Rum from different sources cannot be used indiscriminately. A good St. Croix rum serves the purpose best, but it must be considerably stronger than what is generally brought into the market from there.

After having thus obtained the proper materials for the distillation, the next care is to be bestowed upon the operation. Distillation by steam, in large copper stills, ensures, to a certain extent, a uniform good quality of distilled bay spirit; it never gets burnt; the distillation is not carried too far; nothing of the fine aroma is lost by this process, which generally is the case by distilling over an open fire. Nearly all the distilled commercial bay rums are prepared over an open fire, to the great detriment of the flavor, but most of the bay rums in the market are not the product of distillation, being simply a solution of bay oil of a more or less good quality in common rum, or even in alcohol.

A comparison of bay spirit distilled from fresh material by steam

with other bay rums will at once show the difference, the former being much stronger and finer in odor, so that a small quantity of it has not merely the same strength as a larger quantity of the others, but its odor will be found to be much more lasting and agreeable.

Bay spirit is used as a wash for the face, the hands, and the whole body, refreshing and invigorating the skin, and is highly valued for soothing the soreness after shaving, when diluted with water. A bath to which about a quarter of a bottle of bay spirit is added strengthens the flesh, takes away the heat and dryness of the skin, gives softness and strength to the tired limbs, destroys all smell of perspiration, and produces a feeling of invigoration. In the sickroom it is invaluable, as well for the sick person as for those around him; it purifies and refreshes the air in a remarkable degree. It is inestimable to travelers, especially in hot climates or in summer in the North, quickly relieving the feelings of lassitude of voyages. In fact, its uses are numberless, and, while other perfumes quickly sicken many persons with excess of fragrance and the pungency of their aroma, the consumer will never get tired of using a good bay spirit.

St. Thomas, D. W. I., February, 1882.

EXTRACT OF VANILLA.

By George W. Kennedy, Ph.G.

The object of the writer is to present to the numerous readers of this journal a reliable formula, which has, in his hands, proved very satisfactory during the past eight or ten years that it has been used. Prior to that time I had experimented considerably with menstruums of various alcoholic strength, and also with mixtures containing glycerin. I obtained good results from some, but the formula I have adopted I prefer to all others, and am satisfied that even the inexperienced can manufacture a good preparation, provided they use a good quality of bean and carry out the manipulation properly. The formula does not differ materially from the many in general use, both as to alcoholic strength and the quantity of bean used, although some pharmacists use less than one ounce to the pint; but to insure uniformity throughout the country, I think that the strength indicated should be generally adopted.

For exhausting the vanilla, various writers have suggested simple percolation, repercolation, digestion — both with a cold and warm

menstruum and either for a limited or an unlimited period—and prolonged maceration followed by percolation. The writer prefers simple percolation, which, of course, requires to be skillfully managed. Some writers have recommended strong alcohol as a menstruum. This, I believe is unnecessary, as it is a waste of alcohol, making the preparation more expensive without obtaining better results. I have found 50 per cent. alcohol to answer the purpose admirably, and as vanillin, to which the odor is due, is soluble in this menstruum, it is, in my judgment, the most desirable one to use.

As there are many varieties of vanilla in the market, attention should be given as to its selection. A good quality, although perhaps decidedly more expensive at the outset, will be the cheapest in the end for preparing the extract. There is an inferior kind of Mexican vanilla sent into the market, cut up into small pieces of an inch or a little more in length, which consists of beans unfit to be bundled up, and is offered at the low price of $5 per pound. It is unwise to purchase vanilla in a broken condition. In the manufacture of an extract only a good quality of Mexican bean should be used, which has a peculiar, agreeable, characteristic odor of its own, whilst some of the other kinds have an odor resembling that of tonka, which, in my judgment, makes those varieties decidedly objectionable. You might almost as well use a certain percentage of tonka bean as the lower kinds of vanilla for the purpose of making a cheap flavoring extract. A preparation should be sold be sold for what it is, and nothing else. If it contains tonka call it, say, compound extract of vanilla for flavoring, or any other suitable name, but, above all, do not throw it upon the market as extract of vanilla. There are those people perhaps, though very few, who prefer the odor of tonka, which is due to coumarin, but for their use an extract of tonka could easily be prepared.

A short time ago I was offered, by a traveling salesman, a bean at $4 per pound. He stated for extract purposes it was just the thing, and was largely sold to ice cream makers and others. They were about six inches long, bright brown in color, quite dry and brittle, void of odor, and would remind one of a bean that had lain in alcohol for weeks, taken out and dried. Cheap and worthless extracts of vanilla appear to be largely sold, and perhaps mainly by grocers.

The formula proposed is as follows:

Take of Good Mexican vanilla, ... ℥iv
Sugar (granulated), ... ℥iv
Alcohol, water, of each a sufficient quantity.

Cut the bean transversely into small pieces, place the sugar and the cut bean into an iron mortar of convenient size, and reduce to as fine a condition as practicable, after which moisten the powder with a mixture of alcohol and water in proper proportion, so as to obtain a menstruum containing not less than fifty (50) per cent. of alcohol; then carefully pack the moistened powder in a cylindrical percolator, close the lower orifice with a cork, pour on more menstruum of the same strength (sufficient to cover the surface of the powder), cover the top of the percolator, and allow it to remain undisturbed for twenty-four hours; then remove the cork and permit percolation to proceed, not faster than at the rate of 40 drops per minute, and continue until four pints have passed, when the preparation is completed.

A similar formula was published in this journal, 1876, page 342.

THE BARK OF FRAXINUS AMERICANA.

Abstract from two Theses presented to Philadelphia College of Pharmacy.

The White or American Ash grows from Nova Scotia and New Brunswick to the western shores of Lake Superior, southward to Florida and Louisiana, and westward to Eastern Nebraska and Kansas. It attains a height of sixty to eighty feet, the trunk being from four to six feet in diameter. The wood is light, tough, very strong and elastic, and is extensively used in the manufacture of agricultural implements, carriages, oars, cabinet-work, etc. The bark is collected from the trunk and root, the latter being preferred. As seen in commerce it is usually in pieces varying from three to six millimeters (one-eighth to one-quarter inch) in thickness, from twenty-five to seventy-five millimeters (one to three inches) in width, and sometimes fifteen centimeters (six inches) in length. The suberous tissue being generally removed from the old bark, this is externally whitish or grayish-yellow, sometimes reddish or brown-red, frequently with irregular longitudinal ridges and warts from adhering cork; internally it is yellow and smooth. Its transverse fracture is very fibrous, its odor is slightly aromatic, and its taste bitter and slightly acrid.

John M. Bradford, Ph.G., determined the amount of extract obtainable by different menstrua. The experiments appear to have been made with air-dry bark, and the amount of moisture left in the extracts does not appear to have been ascertained. In each case 1,000

grains of the powdered bark were exhausted by percolation, and the resulting liquor evaporated in a water-bath; the yield was as follows:

1.	Menstruum:	strong alcohol, . .	yield:	22·4	per ct.	extract.
2.	"	alcohol 4 parts, water 1 part,	"	26·2	"	"
3.	"	alcohol 4 parts, water 2 parts,	"	28·2	"	"
4.	"	alcohol 4 parts, water 3 parts,	"	29·0	"	"
5.	"	alcohol 4 parts, water 4 parts,	"	31·6	"	"
6.	"	alcohol 3 parts, water 4 parts,	"	31·6	"	"
7.	"	alcohol 2 parts, water 4 parts,	"	31·6	"	"
8.	"	alcohol 1 part, water 4 parts,	"	31·8	"	"
9.	"	water (percolate turbid),	"	28·8	"	"

All the extracts had a bitter taste, and the bitter principle is therefore soluble both in alcohol and water. The alcoholic extracts were soluble in water, leaving no perceptible residue, but yielding a slightly cloudy solution from suspended resin.

The bark exhausted with ether, and the ether evaporated spantaneously, yielded a fatty matter lighter than water, and having a green tint, which changed to a yellow-red color on heating to the boiling point.

On distilling the bark with water a minute quantity of volatile oil and a white substance was obtained, the latter subsiding in the distillate. The bark was also found to contain starch, gum, tannin and a bitter principle.

Howard M. Edwards, Ph.G., examined a sediment from the wine of white ash bark, and found in it an acid and a neutral resin, sugar, gum and other matters.

In analyzing the bark, the powder was exhausted with a weak alcohol of 15 per cent., the liquid was evaporated to a syrupy consistence and mixed with alcohol, which produced a light-red precipitate of gummy matter having a sweetish and slightly pungent taste, the pungency being probably due to a little resin. The filtrate was concentrated and precipitated by water, a pungent resin having an acid reaction, separating, while the filtrate gave decided indications of the presence of an alkaloid both by Mayer's test and by solution of iodine. This last filtrate was precipitated by subacetate of lead, a thick yellow precipitate being obtained, and the filtrate after having been freed from lead by sulphuretted hydrogen, yielded precipitates with tannin picric acid and ammonia. After adding ammonia, the liquid was shaken with ether, which dissolved the precipitate, leaving the ammoniacal solution slightly red. The etherial liquid, on being evaporated

spontaneously, left no crystals, the alkaloid being contaminated with other substances. The amount of alkaloid being so small, I was not able to carry the investigation further. The alkaloid showed an alkaline reaction with litmus and had a bitter taste; it is doubtless the active principle of the drug.

A decoction of the bark was found to contain sugar and starch; but neither tannin nor gallic acid was found; the reactions which were at first thought to be those of gallic acid, were afterwards shown to be due to coloring matter and acid resin. Ferric chloride gave a blueish-black color; but gelatin and tartar emetic gave no precipitates. (J. M. Bradford obtained a precipitate with gelatin.)

The decoction was precipitated by acetate of lead, the precipitate washed, suspended in water, decomposed by H_2S, filtered, heated and then tested: ferric chloride gave a blue color; gelatin solution, tartar emetic, lime solution and ferrous salts gave no reaction; but sodic hydrate gave a brown color.

The volatile oil, obtained by distillation with water, was aromatic and had a bland taste.

The following pharmaceutical preparations were made:

The *tincture*, made with 20 per cent. alcohol, four troyounces to the pint, was bright red, slightly aromatic, of a bitter taste, and exposed to the cold became slightly turbid.

The *fluid extract*, made with a menstruum composed of water eleven parts, glycerin one part and alcohol four parts, was deep red or blackish red, very bitter and slightly pungent.

The *extract* was made with 20 per cent. alcohol; yield, seven parts from twenty-four parts of the drug; it is of a blackish-red color and has an extremely bitter and burning taste.

ANALYTICAL RESEARCHES AND INVESTIGATIONS.

COLLATED BY PROF. FREDERICK B. POWER, PH.D.

The Estimation of Glycerin in Sweet Wines. By Dr. E. Borgmann. —The author calls attention to the difficulty of correctly determining the amount of glycerin in wines which still contain much unfermented sugar. According to the method of Reichardt, as modified by Neubauer and the author, the sugar by the treatment with lime becomes converted into saccharate of lime, which adheres so closely to the sides of the dish that it can only be removed with great difficulty. For this

reason the author proposes the following modification of Reichardt's method, when it is required to estimate the glycerin in wines containing sugar. 100 cubic centimeters of the wine are evaporated with a little quartz-sand upon the water-bath to dryness. The residual syrupy mass is then successively extracted with absolute alcohol (100 to 150 cubic centimeters, according to the amount of sugar), and the liquids subsequently mixed in a large glass flask. For 1 part of applied alcohol 1½ part of ether is added, the mixture well shaken, and then allowed to repose until the liquid has become perfectly clear. The larger portion of the sugar will be deposited as a syrupy mass, while the entire amount of glycerin will be contained in the alcohol-ether solution. The clear solution is then poured off from the deposit and the latter again washed with small amounts of a mixture of 1 part of alcohol and 1½ part of ether. The combined solutions are then distilled, the residue brought into a porcelain dish with the aid of a little water, and further treated as in the case of an evaporated wine containing no sugar, according to the usual method.—*Zeitsch. für Analyt. Chemie*, 1882, xxi, p. 239.

Purification of Carbon Bisulphide.—P. Palmieri recommends, after removing the aqueous layer with which commercial carbon bisulphide is usually covered, to add to every 100 parts of the latter from 2 to 3 parts of anhydrous cupric sulphate, and subsequently well agitating the mixture. When the cupric sulphate, which becomes perfectly black, is deposited and the odor of sulphuretted hydrogen is no longer perceptible, the liquid is filtered or decanted. Absolute purity is obtained when the carbon bisulphide is again rectified over anhydrous cupric sulphate. In order to maintain the carbon bisulphide, which in this manner is said to lose all disagreeable odor, permanently pure, it may be allowed to remain in contact with a little anhydrous cupric sulphate. The employed cupric sulphate may be made available for further use in purification by ignition, treatment with sulphuric acid, and subsequently again igniting. E. Allary (*Bull. de la Soc. Chim.*, 35, p. 492) covers the carbon bisulphide to be purified with an aqueous layer, and then adds gradually, with active agitation, a solution of potassium permanganate until the aqueous layer remains permanently red. The product is then washed with water, and finally separated in a separatory funnel. In most cases a further purification by rectification is not necessary.—*Ibid.*, p. 255.

The Detection of Water in Alcohol and Ether.—According to the

observations of C. Mann, when 2 parts of citric acid and 1 part of molybdic acid are heated together in a porcelain capsule until they begin to fuse, a dark blue mass is obtained, which dissolves in water with a slight yellowish-brown color. If strips of paper are moistened with the liquid, and dried at 100°C., they appear blue, but lose this color again when dipped in water. The strips of paper thus prepared are adapted for determining the presence of water in alcohol and ether, the latter bodies having no action upon the blue color; but if they contain water decoloration ensues, and the quicker in proportion to the amount of water present.—*Ibid.*, from *Archiv der Pharm.*, 1882, 17, p. 122.

Examination of Blood Stains. By Victor Schwarz.—The separation of blood from its solutions (in well-water, soap-water, salt-water or normal urine) for the formation of Teichmann's hæmin crystals by means of precipitation is more successful with the use of acetate of zinc than with tannic acid. For the solution of dried blood stains upon linen the ordinarily employed potassium iodide is well adapted, and the obtained liquid is precipitated by acetate of zinc. The spots may also be extracted by digestion for 48 hours at the ordinary temperature with a cold saturated solution of borax, and to the liquid a solution of acetate of zinc added as long as the precipitate appears colored; by the further addition borate of zinc will be precipitated, which prevents or retards the formation of the hæmin crystals from the precipitate. By the previous extraction with borax the preparation containing the hæmin crystals must eventually be warmed again with glacial acetic acid, in order to dissolve foreign substances, before the crystals become distinctly visible. The extraction of mixtures of blood with sand, earth, turf, etc., is best accomplished by means of a cold saturated borax solution, much less effectually with potassium iodide, as the blood solution with the latter decomposes very quickly, so that after a few hours a blood spectrum, which at first is plainly visible, can no longer be detected. In opposition to an older statement of Wessel the author has repeatedly succeeded in forming the hæmin crystals from blood which had become completely decomposed, and possessed a penetrating odor.

According to Struve the detection of blood in suspected spots is most difficult in those which have a very pale color, and which are only observable by means of the sharper contour of the edges. In order to furnish the proof a large segment of the fabric containing the

suspected spot is treated in a suitable glass with a dilute solution of potassa. When the coloration of the alkaline liquid appears no longer to increase the liquid is poured off and the fabric washed with water. The obtained liquids, which are usually turbid, are filtered, a solution of tannin added, whereby the liquid instantly assumes a deeper reddish-brown color, and then made just perceptibly acid with dilute acetic acid; at once or after some time a more or less colored precipitate is separated. The latter is collected upon a filter, washed with water, and two portions of the same brought upon two object glasses. After the addition of a trace of salt they are allowed to dry, and the blackish residue treated in the ordinary way with acetic acid, in the one case with the aid of heat, in the other at the ordinary temperature. After standing quietly for some time, from 20 to 24 hours, the hæmin crystals are sought first in the preparation formed with the aid of heat and afterwards in that prepared in the cold. With the former the crystals are found on the edge of the object glass, with the latter in the middle of the object; the last obtained result is conclusive.

By means of the microscopic examination the author distinguishes with certainty between the blood of mammals (round blood corpuscles) and the blood of birds, etc. (elliptical blood corpuscles with nucleus). In no case can one state, however, with absolute certitude whether a blood stain proceeds from the blood of a man, an ox, a horse, sheep or goat, and only in rare cases can the personal view be expressed, that according to the size and grouping of visible blood corpuscles a stain proceeds from the blood of a sheep or a goat and not from the blood of an animal with larger blood corpuscles.

From the importance of this statement the observations of Schmid in the same connection may be noted. The latter brings the detached blood stain into a watch-glass, allows it to stand with a few drops of a 30 per cent. potassa solution for from 24 to 48 hours, brings it then upon a glass plate, and, when the potassa solution has acted sufficiently, it may be finely divided by means of a needle. A few drops of a fresh 30 per cent. potassa solution were then added, and about 50 of the isolated blood corpuscles measured under the microscope. From the result of these tabulated measurements Schmid concludes as follows: If it be required of the expert to state whether a stain proceeds from the blood of a man or from that of an animal, the first question under certain circumstances may be definitely answered, the second, however, only conditionally.

Struve finally calls attention to the fact that blood stains through the vegetation of mould may become so changed that by the microchemical examination they will yield neither the hæmin crystals nor permit the detection of the structural elements. The color of such dark stains does not proceed from the coloring-matter of the blood, but from fibrin; they are soluble in dilute soda solution, and the solution yields the different reactions of albuminous matters.—*Ibid.*, pp. 311 to 315.

On the Crystallizable Yellow Coloring Matters of Galangal. By E. Jahns.—In the year 1839 Brandes discovered in the galanga rhizome a substance to which the name of *kampferid* was applied. The author has now determined that the latter is a mixture of three different bodies, to which he has given the names of *kampferid*, *alpinin* and *galangin*.

1. *Kampferid*, $C_{16}H_{12}O_6$, crystallizes from alcohol in sulphur-yellow flat needles, which melt at 221–222° C., are almost insoluble in water, and sparingly soluble in alcohol. It crystallizes with one molecule of water of crystallization, which is expelled at from 130 to 140°C.

2. *Galangin*, $C_{15}H_{10}O_5$, crystallizes from absolute alcohol in bright yellow flat prisms, which in two molecules contain one molecule of alcohol of crystallization; from dilute alcohol it crystallizes in yellowish-white silky needles, containing one molecule of water of crystallization. Galangin is soluble in 34 parts of absolute and in 68 parts of 90 per cent. alcohol.

3. *Alpinin*, $C_{17}H_{12}O_6$, crystallizes in yellow needles, with one molecule of water of crystallization; it melts at from 172 to 174°C.

By oxidation with nitric acid, kampferid yields anisic acid, while galangin gives benzoic acid; in both cases oxalic acid is also formed.—*Chem. Zeitung*, 1682, No. 17, p. 328; from *Archiv der Pharm.*, 17, p. 161.

Chemical Examination of Tanacetum vulgare. By O. Leppig.—The author has determined in the flowers as well as in the herb of tansy the following principal constituents: tanacetin, tannic acid, gallic acid, volatile oil, fatty matter, a waxlike substance, mucilage, albuminous matter, tartaric, citric, malic and oxalic acids, a lævogyrate sugar, resin and meta-arabinic acid. The bitter principle, tanacetin, is contained chiefly in the flowers; it is amorphous, and has the composition $C_{11}H_{16}O_4$. With concentrated sulphuric acid it becomes

yellow, then brown, after a short time reddish-brown, and finally changing to a dark blood-red color. The edge of the liquor becomes bounded by a narrow blue ring, which, when stirred by means of a glass rod, shows blue stripes. The tanacetum-tannic acid corresponds to the formula $C_{23}H_{29}O_{31}$; on boiling with dilute hydrochloric acid it appears to become decomposed into sugar and catechin.—*Ibid.*; from *Pharm. Ztschr. f. Russ.*, 21, pp. 141, 169 and 193.

On Galactin. By A. Muntz.—The author has extracted from leguminous seeds a substance to which the name of galactin is applied, and which is considered as a definite chemical principle. It is obtained by treating powdered lucerne seeds with water containing a little neutral acetate of lead. To the liquid thus obtained a slight excess of oxalic acid is added, which precipitates the lead and the lime, after which to the clear liquid one and a half times its volume of 92 per cent. alcohol is added. A white mass is thus obtained which remains attached to the rod with which the liquid is stirred. The mass is expressed, washed with water containing a considerable amount of alcohol, then re-dissolved in water and precipitated a second time by alcohol.

When thus prepared, and dried by exposure to the air, it presents the form of white, translucid nodules, containing a small quantity of mineral matter. It swells in water, then dissolves slowly, similarly to gum arabic. The solution is viscid, but limpid; it is not precipitated by the neutral, but by basic acetate of lead, and shows the same deportment to metallic compounds as gum arabic. Its composition is that of the latter, $C_6H_{10}O_5$; it is dextrogyrate, and its rotatory power with sodium light is $+84{\cdot}6°$. When treated with nitric acid it yields a large amount of mucic acid. When treated at the temperature of 100°C. with dilute mineral acids, it is slowly transformed into saccharine matters, which, when brought to the consistence of a syrup, yield hard, brilliant crystals, readily obtained pure by repeated crystallization from alcohol; there then remains also an uncrystallizable sugar. The crystals are but sparingly soluble in cold alcohol, but dissolve in boiling alcohol, from which they are deposited in the form of a crystalline crust. Their taste is slightly saccharine; but they are very different from arabinose, a sugar which is generally obtained by treating gum with dilute acids. In all their properties they approach more closely to the *a* galactose of Fudakowsky, which is obtained by the decomposition of sugar of milk. A comparison with galactose has confirmed the identity of the two products, they having the same rota-

tory power and the same melting point, 161°C., while the melting point of arabinose is 143°C.

The gum of the seed of lucerne is thus a distinct substance, and in consequence of yielding the same products of decomposition as sugar of milk by the action of dilute acids, the name *galactin* is applied. It is abundant in vegetable products, in the seeds of the leguminosæ, and particularly in those which contain no starch. It appears to be localized in the testa, of which that of the seed of lucerne contains 42 parts by weight in 100. It is digested by animals, but cannot be saccharified, however, by the saliva or by the pancreatic juice. From the remarkable property of this body in yielding galactose, the author thinks it possible that it may form a portion of the material from which the herbivorous females derive the elements of sugar of milk, secreted by their organs of lactation, and the origin of which is still enveloped in mystery. The sugar of milk is of rare occurrence in the vegetable kingdom, and has been found with certitude only in the juice of the sapodilla.

The very extended distribution in the vegetable kingdom of the above described substance, which is employed in alimentation, shows that the elements of sugar of milk are at the abundant disposition of herbivorous animals.—*Rép. de Pharm.*, 1882, No. 3, pp. 107–109.

METHOD FOR THE ESTIMATION OF TOTAL ALKALOIDS IN BARK.

By Dr. J. De Vrij.

Abstract of a paper in the Nieuw Tijdschrift voor de Pharmacie in Nederland, January, 1882.

In the "Archiv der Pharmacie" for August, 1881, two methods for the estimation of the total alkaloids in bark were proposed by Prollius, one of which the author has tested and now recommends as yielding, with a slight modification, excellent results.

The principle of the method referred to consists in using for the extraction of the alkaloids a mixture of 88 parts (by weight) of ether, 8 of alcohol (92 to 95 per cent.), and 4 of liquid ammonia. Prollius directs 10 grams of this liquid to be taken for every gram of bark, but the author recommends the proportion of menstruum to be doubled.

The following is the method as modified by the author: 10 grams of finely-powdered bark are introduced into a well-closed bottle and, after being carefully tared, 200 grams of the ethereal liquid are added. The whole is now shaken at intervals during an hour, this length of time having been ascertained by comparative experiments to be sufficient. The bottle is then again weighed and, if evaporation have taken place, the necessary quantity of ether mixture is added.

As much as possible of the clear liquid is now poured off into a flask, and the bottle again weighed; the difference in weight gives the amount of solution taken. The ether is then recovered by distillation, and the residual liquid, containing alkaloid and waxy matter, is transferred to a tared porcelain dish and glass rod, the flask being washed with a little spirit. The evaporation is now continued on the water-bath until the weight is constant. This gives the amount of crude alkaloid. For instance, 10 grams of succirubra bark were digested with 200 grams of ethereal liquid. 159·8 grams of the clear solution gave a residue of 0·78 gram, or 9·76 per cent. of crude alkaloid.

To estimate the pure alkaloids, the crude residue is dissolved in dilute hydrochloric acid, filtered, washed as long as the washings precipitate with solution of soda, and the whole made alkaline and shaken with chloroform. After standing twelve hours, the clear chloroformic solution is run into a flask and evaporated by distillation. The residue is transferred, with a little spirit, to a tared dish and stirrer, and heated on the water-bath till the weight is constant. Particular attention should be paid to the latter point. In the instance referred to, 0·648 gram of alkaloid was obtained, equivalent to 8·11 per cent., or about 1½ per cent. less than the amount of crude alkaloid. The author is of opinion that by estimating the crude alkaloid and deducting 1½ per cent., a result will be arrived at with loss of but little time, which, for the practical purposes of the pharmacist, will be sufficiently near the truth. Of course the same method is applicable for the examination of the ext. cinch. liq. (De Vrij).

From a sample of cinchona bark, 10·01 per cent. of pure alkaloid was obtained, whilst a former estimation, by the lime and spirit method, had yielded 10·02 per cent. The close agreement of these two determinations confirms the reliability of this method, which the author confidently recommends.—*Phar. Jour. and Trans.*, March 12, 1882.

THE BOTANICAL SOURCE OF CINCHONA CUPREA.

By José Triana.

Since the publication of my "Nouvelles Études sur les Quinquinas," Dr. Hesse has remarked the appearance in commerce of a new bark which differed from those of all known cinchonas in its aspect, density, texture and color, etc., but which contained alkaloids characteristic of the true cinchonas. Subsequently, Professor F. A. Flückiger, in the "Neues Jahrbuch f. Pharmacie," xxxvi, 296, stated that the same bark differed considerably from the cinchona barks in its anatomical structure, which he compared to that of *Cascarilla magnifolia*, and gave to the new bark the name of cuprea cinchona, on account of the dull coppery tint of its external surface.

During the last few years especially there have been introduced into Europe considerable quantities of new barks, which have maintained in commerce the name of "cuprea bark," and the importations have been so large that the price of all cinchona barks and of sulphate of quinine have been very sensibly lowered.

The chief emporium and centre of exportation of the cuprea barks is Bucaramanga, in the State of Santander, and the trees which yield them are found in abundance in the mountain chain of La Paz, which breaks off from the great eastern branch of the Columbian trifurcation of the Andes, and runs parallel to the course of the Magdelena river, separating it from its affluent, the Suarez. At first there was only one firm in Bucaramanga which exported the bark, and by keeping secret the use to which the bark was destined, it succeeded for some time in maintaining a kind of monopoly. But attention having been roused by the regular exportation, it at length became known that these barks were considered to be the produce of cinchonas, and much valued in Europe; from that time an eager search was made for them, and their exportation soon assumed such proportions that the bark market became rapidly overloaded and supplied with sufficient to last for a long time.

The impetus having once been given, the search for cuprea bark was prosecuted in other forests of Columbia, and barks quite equal to those of Bucaramanga were found towards the base of the great eastern branch of he Cordillera of the Andes, and as far as the great plain which extends to the Orinoco, and in the valleys of the rivers

Meta and Guaviare, affluents of the river Orinoco, and these barks pass in commerce under the same name as those first discovered.

The cuprea bark at present in commerce is therefore furnished by two very distinct regions: the one, just described, in the great basin of the river Orinoco, to the South of Bogotá, and the other, which was the one first explored, in the lower part of the basin of the Magdalena river.

Amongst the numerous cuprea barks received from Bucaramanga, or the northern region, there is occasionly found a relatively small quantity, which has been discovered by M. Arnaud to be peculiar in containing, in place of quinine, a new alkaloid which he has called cinchonamine.

Professor Planchon has also observed that the anatomical structure of the bark containing cinchonamine differs from that of ordinary cuprea bark, and has compared it to that of a *Cascarilla*. He concludes that if the cuprea barks have characters in common which place them outside the genus *Cinchona*, they also present between themselves such differences that they ought to be considered to form specifically distinct types.

Hitherto, the plant or plants which produce cuprea barks have been unknown to science, although the barks have taken so considerable a place in commerce and in the manufacture of sulphate of quinine. Desiring to fill up this gap from a botanical point of view, I made strenuous efforts to obtain in Columbia, specimens of the plants yielding the cuprea barks, and my efforts have been in great measure crowned with success. I have just received documents from the two centres of collection above named, which now enable me to determine and classify the trees which furnish the cuprea cinchona, and to establish their botanical nomenclature. This classification and other facts shortly to be mentioned raise points which seem to me to be of the highest interest in relation to science, commerce, and the cultivation of cinchonas, and to these points I have now to call attention.

The barks distributed in commerce at the present time under the name of cuprea bark are afforded by two distinct districts. They also belong respectively, at least, to two distinct species which, though nearly allied, are yet different from each other and belong to the genus *Remijia*, which comes very near that of *Cinchona* and to the closely allied genus *Cascarilla*. These species are *Remijia Purdieana*, Wedd. ("Ann. Sc. Nat." [3], xi., p. 277), a plant formerly discovered by

Purdie in the forests of Antioquia, upon the left bank of the Magdalena; and *Remijia pedunculata*, Triana (*Cinchona pedunculata*, Karsten, "Spec. Select." i., 53, t. 26).

My identification of the tree from the valley of the Magdalena river is founded upon the only samples that I have received of the cinchonamine-yielding sort, which are identical with those of Purdie. I incline to believe that all the other cuprea barks said to come from Bucaramanga, notwithstanding the difference in their chemical composition noticed by M. Arnaud and the not less remarkable difference in their anatomical structure indicated by M. Planchon, can only be produced by the same botanical species, viz., *Remijia Purdieana;* inasmuch as (1) the barks containing cinchonamine have been exported to Europe as being those of cuprea, without any distinction being made between them, except in remarking that the trees from which the bark was obtained grow in a warmer locality at a lower elevation than the others without, however, indicating tbat they might be different among themselves; and (2) if the trees worked in the northern districts be distinct, the resemblance between the one which is most abundantly exported from Bucaramanga, and which must have been used as a standard of comparison to discover the cuprea bark in the south, would be less than that which exists between *Remijia Purdieana* and *R. pedunculata*, which is very great at first sight.

The difference in the conditions of vegetation where the trees yielding the two kinds of cuprea bark of Bucaramanga grow would suffice, it seems to me, to explain the change in the nature of the alkaloids and the modifications in anatomical structure observed in them. In any case this is a question that I hope I shall be able to solve when samples of the common cuprea of Magdalena, which I am expecting to receive shortly, shall have arrived. But there can be no doubt that if these trees are distinct they must belong to very closely allied species of the same genus.

With regard to the southern district, I am in possession of specimens gathered at Susumuco, Villavicencio, Papamene and on the banks of the Guaviare, etc., localities distant from each other and varying in elevation above the sea level from 200 to 1,000 meters. Notwithstanding slight variations, which cannot be considered as specific characters, all these specimens answer to *Remijia pedunculata*, Triana, a species discovered by M. Karsten and myself between Susumuco and Villavicencio,

and of which my fellow traveler has published a description and a figure in the "Specimina Selecta."

The two Columbian species of *Remijia* which yield the cuprea barks have, at first sight, a very great resemblance, in habit, in the form, size and smoothness of the leaves, in their inflorescence, and in their capsules of almost the same size; they are in reality, however, very distinct and are easily characterized.

Remijia Purdieana has the divisions of the calyx lanceolate-acute, almost linear, and much longer than the tube of the calyx. The stipules are lanceolate-acute and the capsules are also lanceolate.

Remijia pedunculata has the teeth of the calyx small, triangular and almost rounded at the apex; the stipules are obtuse, broad and abovate and the capsules are shorter than those of *R. Purdieana*, which are elliptic.

The resemblance between the barks of the two species is also very great and it would be difficult to find characters sufficiently marked to distinguish them. They are both, in fact, hard, very compact, relatively heavy, the inner surface smooth and more or less of a wine-red tint, the epidermis thin or more or less corky, and striated longitudinally. The fracture is not fibrous, as in many cinchonas.

The cuprea bark which yields cinchonamine is, however, heavier and more compact and more filled with red resinous coloring matter, and its fracture generally appears to be horny.

The yield of quinine from the cuprea barks varies between ·0 and 2 per cent., according to the conditions of vegetation of the trees, which have not yet been sufficiently studied. In this respect they resemble the officinal cinchonas. In both cases it appears that the alkaloids increase in proportion as the trees approach nearer to the upper limit of their zone of vegetation and are better protected by the great forest.

From a chemical point of view, the characteristic and remarkable feature which distinguishes the cuprea barks from the true cinchonas is the absence of cinchonidine, which has been ascertained by numerous analyses made by M. Arnaud, confirming the results obtained by other chemists.

In cuprea barks, quinidine would also be always proportionately more abundant than in other cinchona barks, which would permit the formation of the double salt of this alkaloid with quinine, and would produce, according to Mr. C. H. Wood and Mr. E. L. Barret, ("Chem-

ical News," vol. xlv, p. 6, and "Moniteur Scientifique," 3d ser., xii, p. 144), the new supposed alkaloid, the discovery of which was announced almost simultaneously in England by Mr. D. Howard and Mr. J. Hodgkin, on the one part, and by Dr. B. H. Paul and Mr. Cownley, on the other part, under the names of "homoquinine" and "ultraquinine."[1]

Neverthless the existence of cinchonamine, the new alkaloid studied and isolated by M. Arnaud in certain cuprea barks, remains unquestioned.

The discovery thus made of febrifuge alkaloids in the barks of a group of plants outside the genus *Cinchona*, as defined by me, renders it necessary to reconsider the characters upon which the genus is founded and to estimate its affinities at their true value.

De Candolle constituted his genus *Remijia* from Brazilian plants which St. Hilaire, in his "Plantes Usuelles des Braziliens," had referred to the genus *Cinchona*, which had previously been made known by Vellozo under the name of *Macrocnemum*. These plants are shrubs which grow on the dry and exposed summits of the mountains that extend from north to south of the province of Minas, indicating the presence of iron in the soil, according to St. Hilaire.

According to the same author they have bitter barks which singularly resemble those of the Peruvian cinchonas, and bear without distinction the names of *Quina de Serra* (mountain cinchona) or *Quina de Remijio* (the name of the person who first pointed out to the Brazilians their use as a substitute for the officinal cinchonas).

St. Hilaire, while acknowledging that perhaps the "Quina de Serra" plants were only varieties of one species, yet referred them to three, called *Cinchona Remijiana*, *C. ferruginea* and *C. Vellozii*, and these have been retained by De Candolle under the new name *Remijia;* but I believe, in fact, that they ought to be considered as forms of one specific type. De Candolle, adopting the idea of St. Hilaire, who had called one of these species *Cinchona Remijiana*, in order to preserve

[1] Mr. Triana appears to have overlooked the fact that Mr. T. G. Whiffen also made known the discovery of a new alkaloid, to which he gave the name "ultraquinine," and which was probably the same as that referred to by the other observers. As regards the suggestion that this alkaloid is really a compound of quinine and quinidine we are still without any evidence in support of its probability or of the existence of such a compound.—Ed. P. J.—*See Amer. Jour. Phar.*, 1882, p. 75, 76.

the memory of the surgeon Remijo, to whom is due the use of these plants as febrifuges, gave to his genus the name of *Remijia;* This genus is evidently very near to *Cinchona*, and its affinity has been rendered still more close by the discovery of the cinchona alkaloids in the Columbian species of *Remijia;* but it is clearly distinguished from *Cinchona* by its axillary inflorescence, and its capsules dehiscing from above downwards. In the last character, as well as in the analogy of the structure of their barks, the species of *Remijia* approach more nearly to the genus *Cascarilla;* but from this genus they differ in the prominent and remarkable character of the axillary inflorescence, and also by the presence of alkaloids in their barks, which have not hitherto been discovered in the genus *Cascarilla.*

The genus *Remijia* presents, then, characters sufficiently well defined and constant to keep it distinct from the two genera most nearly allied to it, viz., *Cinchona* and *Cascarilla.*

By the chemical composition of their barks, the "remijias" must now take an important place in commerce and in therapeutics by the side of the cinchonas, of which they are becoming rivals, which confirms te foresight of Remijo and St. Hillaire. Henceforth the two groups of plants will be coupled together, and as the name *Cinchona*, given by Linnæus to the tree of which the bark cured the Countess of Chinchon, will recall this fact, that of *Remijia* will preserve an analogous one from being forgotten.

Beside the generic characters which I have defined, the original species of *Remijia*, as well as those subsequently published, have, as De Candolle remarks, "a peculiar stamp which distinguishes them at first sight from the cinchonas, and which consists of a shrubby habit, in the leaves being sometimes in whorls of three, particularly the lower ones, in the branches and inflorescence being covered with a reddish pubescence, and in quadrifid woody capsules." But these distinctions, due to collateral circumstances, diminish in other species, especially in the two Columbian species herein noticed. Their glabrescent foliage, and especially their coriaceous, bipartite and relatively small capsules, give them a considerable resemblance to several of the officinal cinchonas. It is more than probable that it is to this similarity that the discovery of cuprea cinchona, which has undoubtedly been made by persons without scientific qualifications, is due. Perhaps a botanist would have done as I myself did, when I discovered *Remijia pedunculata*, and would have refused to admit this tree among those

whose barks yield alkaloids, because it could not be ranked among the true cinchonas, and does not correspond in habit with those whose bark abounds in alkaloids.

From the above remarkable facts, there must follow results of the greatest importance to science, cinchona cultivation, commerce and therapeutics.

From a botanical point of view, several ideas concerning cinchonas, which were considered to be sufficiently established, must be greatly modified. For instance, it has been customary to consider that the presence of alkaloids in cinchona was exclusively characteristic of the plants of the genus as hitherto limited, and there have been those who have gone so for as to say that the chemical analysis might serve to control botanical classification, since alkaloids have never been discovered in the genus *Cascarilla* or in other genera allied to *Cinchona*.

It is also admitted that the trees yielding febrifuge alkaloids, especially those of Columbia, as I have stated in my "Nouvelles Études," grow in the elevated regions of the Cordillera of the Andes, where the temperature is mild with scarcely any cold, and prefer the western slopes of the great eastern branch of the trifurcation of the Andes, the other two branches being almost destitute of them.

Since the number of alkaloid-yielding cinchonas has been augumented by the addition of some species of *Remijia*, these plants, regarded as a whole, offer peculiarities worthy of remark, both as to their habitat and their geographical distribution.

The officinal "remijias" of Columbia, as at present known, grow under conditions of elevation, soil, heat and exposure almost the opposite to those which the cinchonas require, and they grow in places only a little above the level of the sea, in the basin of the Magdalena river on one side and in the basin of the rivers Meta, Rio Negro, and Guaviare on the other, without ever reaching the elevated summits of the Cordilleras.

For the cultivation of the species yielding febrifuge alkaloids, whether in their native country or elsewhere, a new and much more extended and varied field is now opened up, and enterprises of this kind will be more numerous and their success more easy and certain. The officinal "remijias," being more hardy and natives of the lower parts of the mountains, loving warmth and not being affected by drought, will lend themselves more easily to cultivation and more especially in

those intertropical countries where the cultivation of the cinchona would be impossible. The cultivation of the cinchonas in the old world will also be affected in consequence.

As to the commerce in bark it has already found in the genus *Remijia* new sources of enterprise in the peculiar conditions and circumstances of its vegetation, which are, as already remarked, different from those of *Cinchona*, and these may be still further increased by the possible discovery of febrifuge alkaloids in other known species of the same genus, natives of Brazil, Ecuador and Peru, or in new ones which may yet be found. Probably also investigation will be made of species of other genera allied to *Cinchona* which have long been overlooked.

I have already remarked that the enormous exportations of cuprea bark that have been made recently have produced a disturbance in commerce, which has lowered the price of the officinal cinchonas in general and of sulphate of quinine in particular, by the accumulation in Europe of barks intended for the manufacture of suphate of quinine and by the temporary stoppage of the exportation of cinchona barks. This paralysis of business is aggravated in Columbia by the temporary neglect of agriculture, the collection of the cuprea bark proving much more lucrative, and also by the stagnation of capital represented by the value of the bark warehoused abroad, and which is usually held as a balance to meet the cost of imported goods. It happens, therefore, that the industry which ought to prove a new source of riches for Columbia has accidentally become a cause of financial disaster.

It may be hoped that this situation cannot last long and that by degrees an equilibrium will be established. Commercial men will become more prudent, and what is of more significance, the cuprea barks will be diminished in quantity in proportion as the sources of production, already rapidly undergoing devastation, become more exhausted, and the difficulty in collecting the bark becomes greater, as has been the case with the officinal cinchonas.

Finally, investigations of the therapeutic properties of the new alkaloids or compounds of alkaloids discovered in the cuprea barks will present considerable interest. It now appears more than probable that these alkaloids or their compounds have passed unnoticed mixed with sulphate of quinine in the manufacture of this substance on a large scale.

The following is a list of the species of *Remijia* :—

Remijia Hilairii, D. C. (Prod., iv, p. 357).—*Syn.* Cinchona Remijiana, St. Hil., Pl. us. Bras.: Cinchona Velozii and Cinchona ferruginea, D. C.; Remijia Velozii and Remijia ferruginea, St. Hil., *l. c.*; Macrocnemum, Vell.

This species grows in dry and barren places on the mountains of the province of Minas.

R. paniculata, D. C.

A little known plant; a native of Brazil.

R. Cujabensis, Wedd. (Hist. Nat. des Quinq.), 93 adn.—*Syn.* Ladenbergia Cujabensis, Klotsch in Hayn. Arzneigewächse, xiv.

This species inhabits forests in the neighborhood of Bahia, in Brazil.

R. Bergeniana, Wedd., *l.c.*—*Syn.* Cinchona Bergeniana, Mart. in Linn. vi; Litt. Ber., 67; Ladenbergia Bergeniana, Klotsch, *l.c.*

A species indigenous in Brazil.

R. firmula, Wedd., *l.c.*; Ladenbergia firmula, Klotsch, *l.c.*

A native of the banks of the Rio Negro, in Brazil.

R. macrocnemia, Wedd.—*Syn.* Cinchona macrocnemia, Mart. Walp. Repert., ii, p. 507; Ladenbergia macrocnemia, Klotsch, *l.c.*

This species grows on the banks of the Amazon, in Brazil.

R. densiflora, Benth. and Hook., Lond. Journ. Bot., iii, p. 215.

A notive of English Guiana.

R. hispida, sp. n. in Herb. Spruce, No. 3248.

Grows near Esmeralda, on the Orinoco river.

R. tenuiflora, Benth., *l.c.*

A species which is found between Barra and Barcelos, on the Rio Negro in Northern Brazil.

R. Purdieana, Wedd., in Ann. Sc. Nat. (3 ser.), xv., p. 272.

This species, which is one of those yielding the cuprea cinchona bark grows in the forests of both banks of the lower Magdalena, in Columbia, in the provinces of Antioquia and Santander.

R. pedunculata, Triana, Nouv. Études.—*Syn.* Cinchona pedunculata, Karst., Specim. Select., i, 53, t. 26.

This species, which also furnishes the cuprea cinchona of commerce, grows between 200 and 1,000 meters above the level of the sea, on the eastern slopes of the eastern Cordillera, on several affluents of the Orinoco and Amazon rivers, such as the Rio Meso, Rio Negro, Guaviare, Papamene, Zarapote, etc.—*Phar. Jour. and Trans.*, April 22, 1882.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Wrightia antidysenterica R. Br. (also placed in the genera Nerium and Holarrhena) is known in India as "kurchi bark," and was formerly known in Europe as "conessi bark,"[1] "Tellichery bark" and "codaga pala." In 1858 Haines discovered in this bark an alkaloid, which he named *conessine;* in 1864 Stenhouse obtained the alkaloid and called it *wrightine*, and recently it has been again described as *kurchicine* by Baboo Ram Chandra Dutta, of Calcutta. The impure alkaloid was used by Dr. J. M. Coates in the Medical College Hospital and found to possess decided antipyretic properties and in doses of 3 grains, 3 times daily, to be most effectual where chylopoetic congestions existed, but to be less effectual where the spleen is enlarged and blood anæmic; Dr. Coates holds it to be an excellent adjunct to the ordinary treatment of dysentery, but not as an entire substitute for the ordinary remedies.—*Chemists' Jour.*, March 3; *Drug Reporter.*

Gloriosa superba.—Prof. C. I. H. Warden, of Calcutta, has isolated from the root a yellow, non-crystalline neutral principle, *superbine*, to which the formula $C_{52}H_{60}N_2O_{17}$ has been assigned. It is readily soluble in water, alcohol, chloroform and dilute acids, and yields a white precipitate with tannin, but is unaffected by other reagents. It is extremely poisonous, 0·0107 gm. being a fatal dose for a large cat.

The plant contains also a neutral and two acid resins, salicylic acid, methyl salicylate and a fluorescent principle.—*Chemists' Journal*, March 3; *Drug Reporter.*

Thevetin (see page 177, April number) has been obtained by Prof. Warden as a white crystalline glucoside, slightly bitter, with a faint metallic taste, rapidly followed by a pricking and numbing effect on the tongue. 0·01 gm. injected into the stomach produced no apparent effects; 0·1 gm., however, was fatal in 25 minutes, death being produced by most violent convulsions. The analytical results of thevetin dried at 145° C. were C, 57·408; H, 7·478; O, 35·114, more of H and less of O being found than was obtained by Blas.—*Ibid.*

Ixora Bandhuca Roxb. s. I. coccinea, *Lin.*, var. Bandhuca, *Kurz*, is an East Indian shrub of the order Rubiaceæ. The root has been used for a long time as a remedy in intermittent fevers, in hæmoptysis and

[1] Some authors have referred conessi bark to Echites pubescens, Buchan. —EDITOR.

externally in various cutaneous diseases. More recently it has been recommended in diarrhœa and in dysentery, according to the "Indian Medical Gazette," preferably in the form of tincture made from four ounces of the bruised fresh root and one pint of alcohol. A compound tincture is obtained by adding three drachms of powdered long pepper. The dose is from 30 to 60 grains, three or four times a day. It has an agreeable aromatic taste.

Diastatic Ferment in Egg Albumen.—F. Selmi observed that a filtered aqueous solution of albumen, on being digested with a solution of starch, converts the latter into sugar. The ferment is not precipitated from the aqueous solution by alcohol, and may be obtained in the solid condition by evaporation at a low temperature.—*Monit. scient.*, xii, 70; *Chem. Ztg.*, 1882, 47.

Oil of Satureja montana, Lin.—This plant, grown on the mountains in the neighborhood of Grasse, was subjected to distillation, 150 kilos yielding about 125 grams of volatile oil. This was examined by A. Haller, who found it to be of a yellowish-orange color and of an odor resembling that of origanum. It is a thin liquid, has the density 0·7394 at 17°C., deviates polarized light to the left, and consists of two hydrocarbons, with 35 to 40 per cent. of carvacrol and a small quantity of an oxygenated body, boiling below 235°C. One of the hydrocarbons distils between 172 and 175°, the other between 180 and 185°C.—*Jour. Pharm. et Chim.* March, 1882, 357 to 360.

Constituents of Codliver Oil.—From an investigation made by P. Carles mainly on the presence of phosphorus and iodine in codliver oil the author has come to the following conclusions:

That through improvements in the method of extracting oil from cods' livers the old crude oils have been replaced by improved slightly colored clear oils, having an odor and taste which are not disagreeable, and which can be borne by stomachs that tolerate sardines, anchovies, etc.

That of these different oils the modern natural pale oils are in every respect to be preferred to the brown empyreumatic oils.

That, independently of their physical and organoleptic properties, the golden green virgin oils ought to be esteemed the best, as they are the lightest for the stomach, having scarcely any acidity and no acridity. (The acid calculated as acetic acid varied from 0·01 per cent. in a white oil to 1·80 per cent. in an ordinary brown oil.)

That all kinds of codliver oil contain infinitesimal quantities of

iodine, doubtful traces of bromine and small quantities of combined phosphorus, so that it is difficult to see in any of these elements the cause of the reconstituent action of the oil.

That the active principle appears to reside nearly entirely in the peculiar fatty body itself, which is present unaltered in virgin oils.

Finally, that these modern virgin oils constitute a product essentially assimilable, and that their association with another medicine does not injure its tolerance or therapeutic action.—*Phar. Jour. and Trans.* 1882, Jan. 25, p. 604-606; *Répertoire*, Jan.

Euphorbium is used, according to "Pharmacographia," as an ingredient in the preparation of a durable and non-corroding paint, chiefly for painting ships' bottoms to repel marine animals, in consequence of its acrid nature. John R. Jackson states that for this purpose euphorbium has of late years been largely used; the supply, however, from Morocco, has been limited, and the company manufacturing the paint was at one time compelled to obtain its supply from a species of Euphorbium growing in Natal, but owing to carelessness in collecting this source had to be abandoned. From a correspondence between the British Foreign office and the consuls in Morocco it is learned that the plant is indigeaous to the Southern provinces, at the foot of the lower range of the Atlas mountains. When rain has been plentiful at the commencement of the season, followed by successive summer heat, the yield is large, which generally happens every third or fourth year. The plant is about three feet high, grows wild over a large area of open country, and the gum is collected in early autumn, say July to September or October. It is gathered by poor people and taken to the city of Morocco, whenever it is known there is any demand for it; from thence it is brought to the ports on camels at a low rate of transport. Large quantities would be yearly procurable, if the demand was regular and continuous.—*Phar. Jour. and Trans.*, March 4, p. 723.

Recognition of Black and Green Hellebore.—Prof. A. Herlandt recommends exhausting the bruised rhizome of Helleborus niger or H. viridis with boiling water; the filtered decoction, on being boiled with one-third its volume of hydrochloric acid, becomes rapidly turbid and acquires a violet tint. On cooling black flocks are separated which are collected upon a filter and washed with ether to remove fat and resin, when the paper will be of a deep violet color, depending upon the production of helleboretin. The reaction may be obtained with

0·05 gram of the rhizome, which is to be boiled with 10 cc. of water. On the addition of ammonia the color of the flocks changes to dirty yellow, but the original color is restored on the addition of acid. The results are less satisfactory if sulphuric acid is employed in place of hydrochloric acid. The rootlets of hellebore give but slight traces of helleboretin. The reaction is not obtained with the rhizome of Actaea spicata or with senega.—*Jour. Med. Pharmacol. Bruxelles*, 1881, p. 347.

Nigella Seeds.—H. G. Greenish found, that the seeds of *Nigella damascena* yield fluorescent solutions with petroleum spirit, but contain no melanthin, whilst the seeds of *N. sativa* do not yield a fluorescent solution, but contain melanthin (see January number, p. 10). The seeds of the two species are in commerce sometimes found mixed, but may be easily separated by picking when once the eye has become accustomed to recognize the difference; those of N. sativa are obovate, three- or four-sided, and without transverse furrows, the face being finely pitted; those of N. damascena are somewhat angular and the seed-coat is covered with transverse furrows or network.—*Phar. Jour. and Trans.*, Febr. 18, 1882, p. 681.

SALICYLATES OF MERCURY.

By H. Lajoux and A. Grandval.

Abstract of a paper in the Journal de Pharmacie [5], vol. v, p. 39.

Salicylic acid is an acid phenol, and its formula may be written: $C_6H_4\begin{cases} CO_2H \\ OH \end{cases}$ From this double function it results that, as a monovalent acid, it can decompose carbonates, and form a first series of salts in which the atom of H in the group CO_2H is replaced by an atom of a monatomic metal. These salts have for their general formula: $C_6H_4\begin{cases} CO_2M' \\ OH \end{cases}$ If the metal is diatomic the formula becomes: $2\left(C_6H_4\begin{cases} CO_2 \\ OH \end{cases}\right)M''$ These salts are the *normal* salicylates.

Like phenol, salicylic acid possesses the property of replacing also the hydrogen of the OH by an atom of monatomic metal. It follows that the salicylates derived from the acid function can further form by direct combination with bases, or by double decomposition, a second series of salts, called *neutral*, which have for a general formula:

$C_6H_4\begin{cases}CO_2M'\\OM'\end{cases}$ or $C_6H_4\begin{cases}CO_2\\O\end{cases}\!\!>M''$ These salts are not very stable, and are converted by carbonic acid into normal salts.

Applying these theories to the salicylates of mercury, it will be seen that the existence is possible of two mercuric and two mercurous salicylates.

A. Mercuric Salicylates.—The first idea that presents itself for the preparation of the mercuric salicylates is to try the action of salicylate of silver upon mercuric chloride. But this process is impracticable because of the insolubility of the salicylates which cannot be separated from the chloride of silver. It was therefore attempted to prepare the mercuric salicylate by double decomposition, in allowing a molecule of normal salicylate of soda to react upon a boiling solution of mercuric chloride. Upon cooling, a relatively not very abundant amorphous white precipitate is produced (about 3 grams for 13·5 grams of mercuric chloride). Reagents, however, and even sulphuretted hydrogen, do not give any indication of a trace of mercury in the liquid, which is acid. In this compound the mercury combined with the salicylic acid is completely disguised. In order to detect it by the wet way, it is necessary to heat slightly the salicylate with concentrated sulphuric acid until it becomes flesh-colored, and then add water; the whole dissolves, the liquid becoming decolorized. The mercury can then be detected in the solution by the ordinary reagents. Analysis of this precipitate showed that it consists of the neutral salicylate: $C_6H_4\begin{cases}CO_2\\O\end{cases}\!\!>Hg''$ This formula explains, up to a certain point the disguising of the mercury, the biatomic Hg″ serving as a link between the oxygen and the group CO_2.

The neutral mercuric salicylate is soluble in solution of sodium chloride, and this explains the relatively small amount of precipitate above referred to; the remainder of the salicylate being held in solution by the sodium chloride formed on the reaction. The acidity of the liquid is due to free salicylic acid.

The reaction is very interesting from a theoretic point of view, since it shows that the neutral salicylate is more stable than the normal salicylate.

The preceding process not being found suitable, the authors tried the reaction of salicylic acid upon yellow oxide of mercury. According to theory it would be necessary to employ a molecule of mercuric

oxide for each molecule of salicylic acid. But in practice it was found that with these proportions in the presence of boiling water no combination takes place, and the yellow tint of the oxide is not sensibly diminished. If, however, without interrupting the boiling, a fresh quantity of salicylic acid be added, the yellow tint diminishes and disappears completely when a second molecule of acid has been added. A white mass is obtained, which, upon cooling and standing, separates into two layers, the lower very dense and amorphous, the upper crystalline, and consisting of interlaced needles of salicylic acid. The whole is collected on a filter and washed with boiling water, and preferably with ether, as the best solvent of salicylic acid, until the ether no longer leaves a residue upon evaporating. The brilliant white amorphous matter left on the filter has the composition of the neutral mercuric salicylate as above indicated. This compound is insoluble in water, ether, and alcohol, and soluble in solution of sodium chloride. It dissolves in aqueous solutions of potassium iodide, and is extremely soluble in potassium cyanide. If a current of sulphuretted hydrogen be passed through the last-mentioned solution, the liquid at length blackens and deposits sulphide of mercury.

Normal mercuric salicylate is obtained by precipitating a dilute solution of salicylate of soda in excess with a dilute solution of mercuric nitrate. The white precipitate produced is collected on a filter and submitted to prolonged washings with water, to remove excess of salicylate of soda and free salicylic acid, until the wash water no longer colors ferric chloride. This precipitate presents all the reactions of the mercuric salts, and its composition corresponds to the formula

$$2\left(C_6H_4\begin{cases}CO_2\\OH\end{cases}\right)Hg''$$

B. Mercurous Salicylates.—These two salts, like the preceding, occur in the amorphous condition.

Normal mercurous salicylate is obtained by double decomposition in precipitating salicylate of soda in excess with a solution, as slightly acid as possible, of mercurous nitrate. The precipitate can be washed with boiling water without fear of decomposition.

Neutral mercurous salicylate is obtained by treating the normal salt just described with great excess of ether, when it breaks up into salicylic acid, which remains dissolved in the ether, and neutral mercurous salicylate, insoluble in ether and water. The ethereal solution is removed by decantation, and the precipitate is washed until the ether

used no longer gives a residue upon evaporation. This salicylate, which is of the color of whey when just treated with ether, has a slightly greenish-gray color when it has been dried at 100°C. It is blackened by alkalies, turns green with iodide of potassium, and gives mercurous chloride with hydrochloric acid.—*Phar. Jour. and Trans.*, March 18, 1882.

PRACTICAL NOTES FROM VARIOUS SOURCES.

By the Editor.

Preservation of Ferrous Sulphate.—The observation of Johanson (see "Amer. Jour. of Phar.," 1882, p. 74), that crystallized ferrous sulphate keeps best in not hermetically closed vessels is explained by W. Rietzel, as being the result of adhering moisture. The crystals of this salt, and notably that obtained by precipitation with alcohol, if thoroughly dried, keep very well in a dry atmosphere and in closed vessels, but not in moist air, when hydrogen dioxide is formed and the oxidation of the salt facilitated. Ferrous sulphate containing 6 H_2O is not oxidized in contact with air.—*Phar. Centralhalle*, 1882, p. 130.

Preservation of Tannate of Lead.—This compound, prepared according to the German Pharmacopœia, in a short time acquires an acetous odor in consequence of the oxidation of the alcohol. If, however, the latter is replaced by an equal quantity of glycerin, the gelatinous tannate keeps very well and may even easily be mixed with lard or with cerate.—*Jour. Phar. d'Alsace-Lorr.*, March, 1882, p. 50.

Nutrient Suppositories.—Mr. H. E. Spencer, L.R.C.P.E., communicates the following to the "Practitioner":

Artificially-digested meat is mixed with a little wax and starch, and made into a suppository. These suppositories are of such a size that the digested and extracted product of twenty ounces of meat from which the insoluble matter is removed is contained in about five suppositories. The convenience of this method is very great. It is easy for most patients to introduce them themselves, and their use is attended with no discomfort whatever in the majority of cases. After an hour or two the waxy basis is frequently returned, the peptone and extractive being absorbed. In some few cases, owing to irritability of the rectum, the whole suppository has returned; but this can be obviated by the addition of a little opium to each suppository.—*Amer. Pract.*, April, 1882. p. 227.

Pencils of Iodoform are prepared by K. Mueller by triturating 92·5 grams finely-powdered iodoform with a solution of 5 grams gum arabic in 2·5 gm. each of glycerin and water until a plastic mass is obtained, which is rolled out to the desired thickness, and cut into pieces of about 10 centimeters (4 inches). Should the mass become too brittle a few drops of water are added. The pencils become dry in about two hours, and to prevent flattening are laid upon wax-paper, creased so as to form a gutter.—*Phar. Ztg.*, 1882. No. 13, p. 92.

Cheap Logwood Ink.—J. Schmieden recommends the following process: Dissolve extract of logwood 750 gm., in 14 liters of boiling water, add 750 gm. of alum, and when dissolved 200 gm. of sulphuric acid, and with continuous agitation 80 gm. of yellow potassium chromate, previously dissolved in 500 gm. of lukewarm water; finally, add a solution of 100 gm. of ferrous sulphate in 300 gm. of crude hydrochloric acid, dissolve in the ink 100 gm. of gum arabic and dilute with water to 20 liters. The ink writes with a reddish color, but on drying is deep black.—*Phar. Ztg.*, 1882, No. 11, p. 78.

Aqua traumatica Sendneri.—Cinchonine sulphate 1·0, alum 2·0 are powdered and dissolved in distilled water 200·0; to this is added tincture of opium 5·0 and tincture of benzoin 20·0. The milk-like mixture is either injected into suppurating wounds or it is applied upon linen or lint; it is a disinfectant, soothes pain, and promotes healing. Quinidine sulphate may be substituted for the cheaper cinchonine salt.—*Phar. Centralhalle*, 1882, p. 133.

Lithium iodide is recommended by Prof. Zeisst, of Vienna, in such cases where other alkaline iodides and iodine preparations are not tolerated. It is conveniently given in pills as follows:

℞	Lithii iodidi, ...	1·50
	Pulv. et extr. quassiæ, ...	9·50
	ut fiant pilulæ, No. xx	
S.	One pill morning and night.	

For obtaining the salt, a solution of ferrous iodide is first prepared from 127 parts iodine, 33 parts iron filings, and 300 parts water. To this is gradually added 38 parts lithium carbonate, and after decomposition, the liquid is filtered and evaporated in the usual manner.—*Ibid.*, 134.

Ferrand's Laxative Electuary is composed of flake manna 30 grams, calcined magnesia 4 grams, and clarified honey 30 grams. It is used

at the Laennec Hospital for phthisical patients and is given in doses of a tablespoonful before breakfast.—*L'Abeille méd.*, 1882, p. 24.

Glycerin ointment may be obtained of a soft consistence and perfectly permanent by preparing it, according to F. Katschinsky, from gelatin 1 gram, glycerin 96 grams, starch 144 grams, and a sufficient quantity of water.—*Phar. Zeitschr. Russl.*, 1881, No. 35.

Examination of Unguentum Hydrargyri.—Instead of removing the fat by means of benzin, ether or chloroform, C. Thein proposes the following process: 6 grams of the ointment are placed upon the bottom of a rather narrow test tube; 2 or 3 grams of magnesium sulphate or other neutral salt are added with enough distilled water to nearly fill the test tube, and the whole is heated until the fat which rises to the surface has become clear. The liquids are now allowed to cool, a splinter of wood being inserted in the fat, by means of which the latter after it has solidified may be easily lifted out of the test tube after slightly warming it. The fat is then weighed, and the mercury which has settled to the bottom may likewise be weighed after washing it with a little ether or chloroform to remove the last traces of fat retained by the metal.—*Phar. Ztg.*, No. 21.

Stability of Calomel.—Woellmer has examined powders and pills, kept for a period of thirty months, in the dark, in diffused daylight, in dry and in a damp atmosphere. The calomel was combined with sugar, both pure and whitened with ultramarine, with milksugar, gum arabic, aloes, liquorice root, and marshmallow root. Neither the formation of corrosive sublimate nor of ammonio chloride of mercury could be observed. For the solution of the former, sulphuretted hydrogen was employed as the chief test. The absence of ammoniated mercury was proven by treating the insoluble portion with dilute nitric acid, and testing the filtrate with silver nitrate. Decomposition was likewise not observed in a mixture of golden sulphuret of antimony, calomel and sugar.—*Ibid.*

Impure Yellow Oxide of Mercury.—C. Bernbeck has examined a commercial precipitated mercuric oxide which contained 7 per cent. of calomel. It was completely volatilized by heat, but on treatment with hydrochloric or nitric acid left a white insoluble residue consisting of mercurous chloride.—*Phar. Ztg.*, 1882, p. 32.

Impure Carbolic Acid.—Carbolic acid being now frequently met with in commerce in metallic vessels, H. Athenstaedt examined a sample by passing sulphuretted hydrogen into the aqueous solution,

obtaining at once a dark coloration and after some time a dirty white precipitate. On emptying the vessel, the bottom on the inside appeared rough as if corroded, and the solder was similarly affected in several places.—*Ibid.* p. 147.

Extractum Absinthii.—E. Claassen has found perfectly transparent yellowish crystals, which proved to be potassium chloride, in the extract of Artemisia Absinthium, *Lin.* The crystals were of great regularity of form and were combinations of the cube and octahedron, in some of them with a predominance of one of the forms.—*Amer. Jour. of Science,* April, 1882, p. 323.

Pepsin in Seasickness.—In a number of cases pepsin has proved effectual for the prevention of seasickness in passengers who had not made a seavoyage before. When the first symptoms appeared, pepsin, sufficient to cover the point of a knife, was taken, followed by a glass of water acidulated with 5 drops of hydrochloric acid. The dose was repeated several times a day, more especially before and after meals. The favorable results obtained invite to further trials.—*Phar. Ztg.,* 1882, No. 20; *Ind. Blätter.*

Artificial Hunyadi Yanos Mineral Water, which will be found to possess every advantage attributed to the natural water, is made by Prof. Charteris by dissolving magnesium sulphate 514·92 grains, sodium sulphate 519·54 grains, potassium sulphate 2·76 grains, sodium chloride 39·15 grains, and sodium bicarbonate 15·60 grains, in water 16 ounces. Dose, 2 ounces and upwards. A product made by following Liebig's analysis was found to be too weak and did not produce purgative action.—*Phar. Jour. and Trans.,* Feb. 25, p. 703; from *Lancet.*

Preparation of Hydrochloric Acid.—On heating a mixture of calcium chloride and magnesium sulphate in the presence of water, basic calcium-magnesium sulphate and free hydrochloric acid are formed: $CaCl_2+MgSO_4=(MgO,CaSO_4)+2HCl$. G. Eschellmann employs this process for the preparation of a pure hydrochloric acid, by heating a soft mixture of calcium chloride and Epsom salt or kieserite with water to dull redness. Magnesium chloride and calcium sulphate give the same result. The basic salt can be used in the manufacture of soda for the liberation of ammonia from sal ammoniac, magnesium chloride and calcium sulphate being formed, from which mixture on evaporation and heating hydrochloric acid is produced.

Treated in the above manner, a mixture of chloride and sulphate of

magnesium yields hydrochloric acid and basic magnesium sulphate ($MgO,MgSO_4$), the latter of which may be employed for the preparation of magnesia by boiling with water, Epsom salt remaining in solution.—*Chem. Ztg.*, 1882, No. 13.

PHARMACEUTICAL NOTES.

By R. F. Fairthorne, Ph.G.

Manna as an Excipient for Pills.—Certain substances are with difficulty made into pills that will retain the spherical form. Amongst others may be named reduced iron, subnitrate and subcarbonate of bismuth, oxalate of cerium, calomel, bicarbonate of sodium, tannin, extract of logwood, Dover's powder, acetate of lead, sulphate of zinc, chlorate of potassium, phosphate of iron, ammonio-ferric alum, lactate of iron, citrate of iron and ammonium, aloes, and sulphite of sodium. After these have been made up into pills with any of the ordinary excipients of a soluble character, they almost always flatten and often unite together in a mass that is both unsightly and the cause of much inconvenience. This difficulty can be overcome by using manna and syrup in variable proportions, according to the substance operated on. The quantity of manna required is from 25 to 33 per cent. of weight of the article to be made into pills. Thus, if 100 grains of reduced iron are to be made into 50 pills, 25 grains of manna will be required, together with sufficient syrup to make a mass. The quantity of the syrup must be carefully adjusted, so as not to have more than enough to produce a mass of the proper pilular consistence. When this precaution is taken, no difficulty will be experienced in making pills which will retain their proper form. Manna possesses certain advantages over other excipients that render it of value in the instances named; one is its hardness and another its solubility. It is certainly preferable to powdered tragacanth or rice flour, which are frequently used to give consistence to the pilular mass. I would suggest the use of manna in making Vallet's mass, substituting it for both sugar and honey. The mass would be more easily handled and firmer than that as usually met with.

When manna is used in making pills with the substances named it is best to place it in the mortar first and soften it with a few drops of syrup, and add the medicinal ingredients to it.

Elixir of Blackberry.—As summer approaches preparations of an astringent character are frequently called for, and as many of them are unpleasant to take, I offer the following receipt as one that possesses the former quality without the disadvantage of the latter:

Take of Fluid extract of blackberry,	℥ivss
Syrup of blackberry fruit,	℥xv
Jamaica spirit,	℥xii
Curaçoa cordial,	
Cinnamon water	each ℥iv
Syrup of orange peel,	℥iii
Oil of cloves,	
Oil of allspice,	each 12 drops

Mix the essential oils with the fluid extract of blackberry, add the Jamaica rum, and afterwards the other ingredients.

Elixir of Logwood is another preparation of a similar character:

Take of Extract of logwood,	10 dr., 2 scr.
Brandy,	12 fluidounces
Curaçoa,	6 fluidounces
Syrup,	6 fluidounces
Oil of nutmeg,	
Oil of cinnamon,	each 4 drops
Warm water sufficient to make 2 pints.	

Dissolve the extract in the water, add the other ingredients, and, when cool, filter.

Glycerol of Myrrh and Borax.—This preparation commends itself for many purposes, and will be found especially serviceable as an addition to gargles and toothwashes and as an application to sore nipples. It is made by the annexed formula:

Take of Myrrh (in coarse powder),	1 ounce
Powdered borax,	1½ ounce
Glycerin,	
Water,	each 3 fluidounces

Mix the borax and myrrh together, add the other ingredients, and boil in a flask for ten minutes; strain through muslin, and add enough water to make the mixture measure 6 fluidounces; when cold, filter through cotton or paper.

Solution of a considerable amount of the myrrh is effected by the borax, and the addition of glycerin enables a larger quantity of the borate of sodium to be dissolved than in water alone, producing a solution that is miscible with water without precipitation taking place.

This makes an elegant *lotion* for application to the gums, or as a

mouth-wash when diluted with decoction of quillaia bark and flavored with oil of rose or other essential oil.

The following is a very satisfactory formula:

Take of Glycerol of myrrh and borax,	ʒii
Decoction of quillaia (2 ozs. to Oi),	ʒiv
Oil of rose,	4 drops
Oil of cloves,	6 drops
Oil of orange peel,	6 drops

Mix and filter.

A Good Black Ink can be made with the following ingredients:

℞	Galls (in moderately fine powder,	2 pounds avd.
	Copperas,	10½ ounces
	Gum arabic,	10 ounces
	Sugar,	½ ounce

Water sufficient to make 18 pints.

Place the galls in an enameled vessel, pour on it 6 pints boiling water, and allow it to macerate two days; transfer to a glass percolator, in the neck of which is a piece of absorbent cotton, through which allow the liquid portion to drain. When this is accomplished, pack the galls firmly and displace with sufficient water to produce two gallons with that portion of the infusion which first passed. Then dissolve the gum and sugar in 2 pints of water; add this and the copperas to the infusion of galls. This, after standing about twelve days, will produce a very superior ink. About 8 drops of wood creasote should be added to prevent moulding.

SOME REMARKS UPON MODERN PHARMACEUTICAL STUDY.

By H. J. Möller.

If one, after having passed the famous old Quartier Latin, on the left bank of the Seine, stands before the northwestern entrance of the Jardin des Plantes, he may see on the left hand, on the corner of the Rue Linné and the Rue Cuvier, a monumental fountain, erected to the memory of the great zoologist, Georges Cuvier. The female figure which forms the centre of the monument holds in her left hand a tablet bearing the inscription, "Rerum cognoscere causas." A more suitable inscription could hardly have been found for a monument to the great *savant*, who in such a brilliant way showed us the importance of the *comparative studies*.

If one wishes to have a clear view of the present state of pharmaceutical study, and so to be able to choose that education which is the most suitable for his own country, it is necessary to make a *comparison* of the various

systems which are now used in the different countries. What I found of such information in the historical works[1] on pharmacy was all antiquated, and I commenced for myself to gather the following facts from, as I may say, all the corners of Europe.

Having been already nearly one year and a half on an educational tour on the Continent, I have particularly frequented the pharmaceutical institute of the University of Strassburg (Professor Flückiger) and the large School of Pharmacy in Paris (Professor Planchon and Mr. Gérard), have also visited a great many other pharmaceutical schools, and in that way have had the opportunity of seeing a good deal of the present pharmaceutical education. I have also enlarged my own sources of information through a rather extensive correspondence with several of the most eminent pharmacists and pharmaceutical professors, in Europe. All this information I embodied in a pamphlet,[2] which I published some weeks ago in Copenhagen, and had the honor of presenting to T. Greenish, Esq., F.C.S., President of the Pharmaceutical Society of Great Britain, and it is according to his friendly advice that I present to this journal that part of my pamphlet which, perhaps, may be of some interest for English pharmacists. In the Danish edition these remarks are accompanied by a plan for a complete reform of the Danish pharmaceutical study; here I have only briefly communicated, without criticism, the plans for pharmaceutical education which are adopted in the different countries.[3]

I am highly indebted to Mr. Th. Greenish, to whom I return many thanks, for the kindness with which he has given me great and valuable assistance by publishing the following essay in this journal.

England, Scotland and Ireland.

Though English Pharmacy probably is very well known in the United States, the following notes are given, which I owe partly to the kindness of Th. Greenish, Esq., F.C.S., President of the "Pharmaceutical Society of Great Britain," and which are partly taken from the calendar of this Society, published every year.

In *England and Scotland* the government does not regulate pharmaceutical education, but has left it entirely to the care of the "Pharmaceutical Society of Great Britain," which was established in 1841. After the incorporation of the Society by Royal Charter in 1843, a by-law was passed requiring all persons, except those who were in business on their own account before the date of the Charter, to pass an examination prior to admission as a member of the Society. The subjects of examination were

[1] Particularly, Phillippe, "Histoire des Apothicaires," Paris, 1853, and Hermann Ludwig's augmented German revision of this work, Jena, 1858.

[2] H. J. Möller, "Nogle Bemœrkninger om den nuvœrende Pharm. Uddannelse," etc. Köbenhavn, 1881. [137 pages.]

[3] We are indebted to the author for a copy of his pamphlet, and for the resumé of the regulations relating to pharmaceutical qualifications in Great Britain and Ireland, with which we commence this review, and followed by those of the other countries, as published in the "Pharmaceutical Journal and Transactions," omitting the sketch of the pharmaceutical education in the United States as being a subject with which our readers are familiar.—Editor Amer. Jour. Phar.

to be—as they now are—Chemistry, Pharmacy, Materia Medica and Botany, with the practical manipulations of the laboratory and dispensary; also the modes of ascertaining the strength and purity of drugs, the tests and antidotes for poisons, the doses of ordinary medicines and an acquaintance with Latin, the language of prescriptions.

These qualifications were all made more imperative by the *Pharmacy Act* of 1854, by which it was fixed that every person who assumed the title of, or pretended to be, a "Pharmaceutical Chemist," or "Pharmaceutist" in Great Britain, or a member of the Pharmaceutical Society, must have passed an examination. A register must be kept of all such persons. The Act thus established a distinction between qualified and unqualified persons, giving titles which the public might recognize; but it did not otherwise interfere with the sale of drugs or dispensing of prescriptions, and it was not yet necessary that every apothecary should pass this examination, which still was a voluntary one. It remained for the legislature of 1868 to complete the work thus begun.

The *Pharmacy Act* of 1868 commences thus: "From and after the 31st day of December, 1868, it shall be unlawful for any person to sell or keep open shop for retailing, dispensing or compounding poisons, or to assume or use the title Chemist and Druggist, or Chemist, or Druggist, or Pharmacist, or Dispensing Chemist or Druggist, within the meaning of this Act, and be registered under this Act, and conform to such regulations as to the keeping, dispensing and selling of such poisons as may from time to time be prescribed by the Pharmaceutical Society with the consent of the Privy Council."

It will be at once seen that a new class is hereby added to the Register, *i. e.*, "Chemist and Druggist." The Registers are published annually, according to Act of Parliament. It is optional with both classes whether they become members of the Society or not.

The *Society* consists of three grades—Members, Associates and Registered Apprentices or Students. Members must have joined the Society before 1853, or have passed the "Major Examination," and thus have been registered as "Pharmaceutical Chemists." Associates must have passed the "Minor Examination." Registered Apprentices or Students are required to have passed the "First or Preliminary Examination."

Of these examinations the following is the order. The "*First or Preliminary Examination*" is held in thirty-eight cities in Great Britain "at twelve noon, on the first Tuesday in January, April, July and October in every year."

The examination is a *written* one and comprises:

Latin.—Translation into English of a paragraph from the first book of Cæsar [De Bello Gallico]; Latin grammar.

Arithmetic.—The first four rules—simple and compound; vulgar fractions and decimals; simple and compound proportion; a thorough knowledge of the British and metrical systems of weights and measures.

English.—Grammar and composition.

The "minor" and the "major" are held five to six times a year in London and Edinburgh by a special board of examiners.

The "Minor Examination" [for registration as "Chemist and Druggist" under the Pharmacy Act, 1868]. Candidates for this examination must have passed the "First or Preliminary Examination," and have attained the full age of twenty-one years. Each candidate must produce a certified declaration that for three years he has been registered and employed as an apprentice. The examination embraces: reading and translating of prescriptions and general knowledge of Posology, Practical Dispensing, Pharmacy, Materia Medica, Botany and Chemistry.

The "Major Examination" [for registration as "Pharmaceutical Chemist," under the Pharmacy Act, 1852]. Candidates for this examination must have passed the "Minor" at least three months previously. This "Major" comprises Materia Medica, Botany and Chemistry [also Qualitative Analysis].

In the year 1879, 2,296 candidates were announced; of these 76 passed the "Major," 331 the "Minor," and 753 the "First or Preliminary Examination;" nearly one-half of the candidates were thus rejected.

Great Britain has now a great number of pharmaceutical schools; the most important of these is still "The School of Pharmacy," 17 Bloomsbury Square, London. This school was established by the "Pharmaceutical Society" in 1841. Since 1873, however, the fees have been advanced so much that the Society has ceased to have any pecuniary interest in the school. The number of students in the London school is yet ordinarily only thirty to forty, and thus not nearly so great as for example in the "École Supérieure de Pharmacie de Paris" (about 600), or in the large "Colleges of Pharmacy" in the United States.

In "Apothecaries' Hall," in London, some pharmaceutical examinations are also held, but these have a more private character, and do not have the same legal power as those which are supervised by the great Pharmaceutical Society.

These rules are not all directly applicable to *Ireland*, which has its own laws. In 1791 a law was published which ordered the establishment of an "Apothecaries' Hall" in Dublin, and pharmaceutical examinations were held there also. This is now changed by the new "*Pharmacy Act* [*Ireland*], 1875," according to which the "Pharmaceutical Society of Ireland" was organized. This Society is constituted quite like the English one, and must hold all pharmaceutical examinations, which are nearly identical with the above-mentioned in England.

The weakest point in English pharmaceutical education is doubtless the "First or Preliminary Examination," which is evidently much less severe than the corresponding one in other European countries.

The system of two classes of pharmacists must in my opinion, also be regarded as not quite satisfactory. I believe it to be one of the principal reasons for the present high standing of German pharmacy that there all pharmacists are obliged to pass the "Major." It is true, that in France there are two classes of pharmacists who have passed the "Major," but one must remember that the difference between these two classes consists only in different requirements at the *preliminary* examination, while the *pharmaceutical* examinations are the same, and that both these French preliminary examinations are much higher than the English.

GERMANY.

The laws by which the existing form of pharmaceutical study in Germany has been established, are the "Bekanntmachung des Reichskanzlers vom 5 März 1875, betreffend die Prüfung der Apotheker" and the "Bekanntmachung des Reichskanzlers vom 18 Nov. 1875, betreffend die Prüfung der Apothekergehülfen."

The young man who wishes to be accepted as an apprentice ("Lehrling," in German) in pharmacy has first to prove that he has passed the examinations which are demanded for an "einjähriger Freiwilliger" in the army; but it is necessary that these examinations shall have been passed in a college where Latin is an obligatory branch of study. This corresponds with the English "First or Preliminary Examination," but must be regarded as much more severe; for it is necessary that the young man shall have been one year in the "Secunda," *i. e.*, the highest class but one in the German classical school, and this German examination is nearly equivalent to the Oxford and Cambridge Middle Class Examinations.

When these claims are fulfilled, the candidate must stay three years in a pharmacy; if he has passed "das Abiturienten-Examen" (*i. e.*, the final examination for the highest class in the classical school), he needs to remain only two years as an apprentice in the pharmacy. It must be mentioned here that there is a strong party among the German pharmacists, who wish that the government shall demand this "Abiturienten-Examen" as the basis for all pharmaceutical education.

When the candidate has finished his apprenticeship, he passes his first pharmaceutical examination, the "Gehülfenprüfung" (*i. e.*, examination for assistants), required after January 1, 1876, by the above-mentioned law of November 13, 1875. This examination is not passed in the universities, but before special boards of examiners which are found throughout all Germany, and which consist of two pharmacists and a physician. The "Gehülfenprüfung" is in three divisions and lasts two days.

1. *The written examination* consists of three questions in chemistry, in botany or materia medica, and in physics. The candidates are watched during the six hours which are accorded for the answering of these three questions, and no access to books is allowed.

2. *The practical examination* consists in: (*a*) reading, preparing and taxing three prescriptions; (*b*) preparing one "galenical" and one chemico-pharmaceutical preparation after the Pharmacopœa Germanica; (*c*) examining the purity of two of the chemical preparations of the Ph. Germ. With these practical tests the candidate must present his "Laborations-journal," which he has prepared during the three years of apprenticeship and which includes a short description of all the work he has done in the laboratory in the three years.

3. *The oral examination* consists in: (*a*) recognizing and determining several fresh or dried plants; (*b*) explaining the derivation, adulteration and pharmaceutical use of several drugs and chemical preparations and explaining their composition and preparation; (*c*) translating two articles of the Ph. Germ.; (*d*) knowing the elements of botany, pharmaceutical chemistry and physics. With this oral test the candidate must present

his "*herbarium vivum*," *i. e.*, an herbarium which is collected and arranged by himself during his apprenticeship.

This "Gehülfenprüfung" corresponds to the English "Minor Examination;" but the young man has not yet the permission to possess his own pharmacy: he can only be an assistant.

The candidate must now spend at least three years as an assistant ("Gehülfe") in a pharmacy, and after this stage ("Servirzeit") he may commence his studies for "*die pharmaceutische Staatsprüfung*" (also called "das Apothekerexamen," *i. e.*, the "Major Examination.") He is now obliged to attend the lectures and do practical work in the laboratories of the university. Having thus been at least one year and a half occupied only with his studies, he has the right to present himself for this examination, which can be passed in either of the twenty universities of Germany or in one of the three polytechnic schools of Brunswick (Collegium Carolinum), Stuttgart and Carlsruhe. This examination is demanded by the above-mentioned law of March 5, 1875, and consists of the following five parts:

1. *Preliminary* (*written*).—Three questions in botany or materia medica, in inorganic and organic chemistry.

2. *Pharmaceutical, technical.*—To make two "galenical" preparations and two chemico-pharmaceutical preparations.

3. *Analytical, chemical.*—(*a*) Qualitative and quantitative (gravimetric and volumetric) analyses; (*b*) toxicological research (qualitative and quantitative).

4. *Pharmaceutical scientific* (*oral*).—In botany, materia medica and pharmaceutical chemistry.

5. *Final* ("Schlussprüfung") is also a scientific oral examination and is held in botany, chemistry and materia medica by the professors of the university and in the laws of pharmacy by an apothecary.

Only after having passed this last examination has the German pharmacist permission to possess a pharmacy, but even then he cannot, as in France and England, establish himself without a privilege of the government.

On these short remarks, the English pharmacist will have a valuable commentary in the very interesting article, which has already been published in the Pharmaceutical Journal (Nov. 1, 1871), by Mr. Greenish.

Russia.

The following remarks upon pharmaceutical education in Russia, I have taken partly from a French essay[1] of Dr. C. Méhu, and partly from some communications which Mr. C. Frederking, pharmaceutical chemist in Riga, has been so kind as to send me in answer to my inquiries.

The pharmacists in Russia make their studies in the universities as in Germany. Professors in pharmacy are employed by the universities in Moscow, Kiew, Kasan, Charkow, Dorpat and Warsaw; in St. Petersburg the pharmacists study in the Medico-Chirurgical Academy. All the pharmaceutical examinations are passed at these establishments. In general, the Russian pharmacy, through its whole development resembles the

[1] Journal de Pharmacie et de Chimie, 4 série, xx, pp. 60 and 139.

Scandinavian and German very greatly, and some of the most important Russian pharmaceutical journals are printed in German. A reform of pharmaceutical study in Russia may soon be expected, and if this reform is strictly and completely carried through, it will raise the Russian pharmacy to one of the highest development.

At present the following demands are required:

As in Germany, the candidate for apprenticeship needs to have attended the classical school ("das Gymnasium") before he commences his special education. At present it is only necessary to have passed the three lower classes of the "Gymnasium," but in the new plan for pharmaceutical study, which I shall mention later, it is proposed to require attendance upon six classes of the "Gymnasium," and this will perfectly correspond with the present demands in Germany. If the candidate has passed all the classes in the "Gymnasium" he can, as in Germany, finish his practical education in two years; if not, three to five years' apprenticeship is demanded.

The first pharmaceutical examination, the "Gehülfenprüfung," seems to be nearly the same as the above-mentioned corresponding German examination (the English "Minor"), only this one in Russia is passed before the pharmaceutical professors of the universities and not, as in Germany, before special boards of examiners.

After the "Minor" the candidate must spend three years in a pharmacy as an assistant. (After the year 1881 he can pass his three years as an assistant *after* the "Major"). Now he can commence his studies at the universities. After having occupied himself exclusively with these studies for *at least* three semestres (*i. e.*, one year and a half), and ordinarily for four semestres, he may pass the Russian "Major," "das Provisor-Examen." This embraces oral examinations in mineralogy, chemistry (also special pharmaceutical and toxicological chemistry), zoology, physics and materia medica. These examinations are held by the professors of the universities. The candidate must be able to give the first help to sick and wounded persons. At the practical examination he must recognize and describe two pharmaceutical drugs and two chemical products from their external characters, and make a qualitative and a quantitative analysis of one of those substances; he must also make a forensic analysis and write a report upon this research, must make two chemical preparations under the control of one of the professors, and prove that he possesses the knowledge of bookkeeping, necessary for a pharmacy.

In order to obtain the highest degree, "*Magister Pharmaciæ*," it is demanded: (1) that the candidate shall have been a "Provisor" for one year at least; (2) more severe examinations in the same sciences as in the "Provisor-Examen;" (3) the defence of a dissertation with at least six theses.

These are the present demands for pharmaceutical study in Russia. This country, possessing some of the most famous pharmaceutists of the present day,—I shall here only mention the names Dragendorff and v. Trapp,—has not been satisfied with the above plan, and in the beginning of 1880 the new project, which I have already mentioned, was published.[1]

[1] "Pharm. Zeitschr. f. Russland," 1880, No. 1. [Also in "Pharm. Zeitung," 1880, No. 14.]

According to this *new plan* the obligatory preparatory instruction will be raised from three to six classes in the classical school, and the apprenticeship fixed at two and a half to three years. (If the candidate has passed all the seven classes in the classical school, he can make his first pharmaceutical examination after an apprenticeship of two years.) This first pharmaceutical examination is held in the universities and called "ein pharmaceutisches Controll-Examen" (corresponding to the "Minor"). He has then the right to be an assistant in a pharmacy, and can immediately commence his studies at the universities. After having during *at least* two years followed the lectures and the laboratory work, he may pass "*das pharmaceutisches Candidaten-Examen*" (the "Major"), and will now have the title of "Candidat der Pharmacie" (formerly "Provisor") and the right to manage a pharmacy.

Beyond this there is a higher examination which is called "*das pharmaceutische Magister-Examen*," and corresponds nearly to the old examination of the same name which I mentioned above. This can only be passed when the aspirant has been a "Candidat der Pharmacie" at least two years.

The highest degree in pharmacy will hereafter be the "*Magister und Doctor der Pharmacie*;" this new examination can be passed by the candidate who has been a "Magister" in pharmacy for at least two years, and this test must be regarded as a very severe one; the candidate is obliged to defend another dissertation, more difficult than that for the "Magister-Examen."

The number of pharmacists in Russia is limited, as in Germany, Denmark, Norway, Sweden, etc. The "*Candidat der Pharmacie*," after having arrived at the age of twenty-five, has the right to manage or possess a pharmacy. The "*Magister der Pharmacie*" is preferred in the distribution of new "privileges" for pharmacies, and of the higher pharmaceutical offices; he can also be a lecturer or a "Professor extraordinarius" in the pharmaceutical chairs of the university. The "Doctor der Pharmacie" may become a "Professor ordinarius" in the pharmaceutical chairs of the universities, and has the precedence in appointment to the highest pharmaceutical government offices.

Denmark.

This country had very early an organized pharmacy. As early as December 4, 1672, it was fixed by law that every pharmacist should be examined by the College of Physicians, and by the pharmacists in Copenhagen. June 2, 1828, some new rules were given for pharmaceutical examinations. Since that time nearly all has been unchanged, and the proportionally high position which the Danish pharmacy held a hundred years ago has gradually been lost, and the standard of pharmaceutical study in Denmark (and that in Norway, which country until 1814 belonged to Denmark) must be regarded as at the present lower than in Germany. It is true that pharmaceutical study in Denmark has advanced in the last hundred years, but not nearly so much as in Germany, and the reason of

this proportional slowness of development must be found in the want of a special pharmaceutical school or institute, and in the predominance of physicians in the mutual administration of medicine and pharmacy. It is to be hoped that these two great wants will be removed in the near future and Danish pharmacy be as well situated as now in England, and so possess the most important conditions for its wider development.

The present state of pharmaceutical study in Denmark resembles that in Germany, and it is arranged in the following way:

After having passed his "Præliminair Examen" ("Preliminary Examination") and a special test in Latin, and having also finished his practical course, the young man passes his "Medhjœlperpröve" (the "Minor.") He is now a "Medhjœlper" (assistant) and can immediately begin to follow the lectures at the university in Copenhagen, at the same time he is occupied in the chemical laboratory of the university, and can after the lapse of two or three semesters, pass his last examination. He is now called a "Candidatus pharmaciæ," and has, as the "Apotheker" in Germany, the right to compete at the distribution of vacant or new "privileges" of pharmacies, or he can buy one of the pharmacies which were established before 1842, these pharmacies being the only ones which can be sold. All those which are founded after 1842 are a sort of government offices, which can only be vacant in case of death.

During the last year a powerful agitation has commenced for the purpose of obtaining more severe rules, and other improvements in the pharmaceutical studies, and without doubt a change for the better will be made in the near future.

Norway.

I owe the following information respecting pharmaceutical study in Norway to my friend Morten Nyegaard, Esq., of Christiania, Editor of "Farmaceutisk Tidskrift," the Norwegian pharmaceutical journal. These remarks are mainly taken from a collection of the Norwegian pharmaceutical laws,[1] which Mr. M. Nyegaard published some few years ago.

Norway was connected with Denmark until 1814, and therefore it is quite natural that the rules for Norwegian pharmaceutical education should much resemble the corresponding ones in Denmark.

After having passed a preliminary examination (including a special test in Latin), and having finished his practical education in pharmacy, the young man passes his "Medhjœlperpröve" ("Minor") before a government medical officer. He is now allowed to be an assistant and called "Studiosus pharmaciæ." As in Denmark this "Medhjœlperpröve" must be regarded as a little less severe than the above-mentioned German "Gehülfenprüfung" ("Minor"). Thereafter he can immediately commence his studies at the university in Christiania, and afterwards pass the "Apotheker Examen," also called "den pharmaceutiske Examen" ("Major") which is clearly defined by the law of May 10, 1860. Besides the branches of science belonging to the German "Major," this examination includes zoology, mineralogy, and knowledge of the pharmaceutical drug

[1] M. Nyegaard: "Looe vedkommende det norske Apothekervœsen," etc. . . . Christiania, 1878.

trade (including also the rules for bill-brokerage, exchange and book-keeping by single entry, and knowledge of the laws which relate to pharmacy). Still the requirements in chemical analysis are not nearly so severe as in the corresponding German course. Having passed this last examination, the young man has the title of "Examinatus pharmaciæ," and can now manage or possess a pharmacy.

In the spring of the year 1881, the Norwegian government published a new plan for pharmaceutical study, and this is at present the subject of a lively debate. The most important improvements proposed are the following: The "Minor" shall be held only in Christiania, Trondhjem and Bergen, twice a year, and not, as formerly, by a government medical officer alone, but by special boards of examiners, consisting of two pharmacists and a physician; one of the two pharmacists to be the president of the board. At this examination the student must, as in Germany, present an herbarium, which he has collected and arranged himself. Between the "Minor" and the "Major," he must spend at least two years as an assistant in a pharmacy. The requirements for the "Major" are nearly the same in the new plan as in the old, but the government proposes the establishment of a special pharmaceutical institute in Christiania; the lectures for pharmaceutical students are to be held partly at this institute, partly at the university.

Sweden.

These remarks I have taken partly from a Swedish essay[1] of Mr. M. Holsti, and have partly obtained by correspondence with Professor R. F. Fristedt in Upsala, and Professor N. P. Hamberg in Stockholm, the latter of whom, until a few years ago, was director of the Pharmaceutical Institute in Stockholm. I am highly indebted to these two gentlemen for the kindness with which they have answered all my inquiries.

According to a law of December 19, 1879, a "First or Preliminary Examination" and a special test in Latin must be passed before the student enters the pharmacy. This examination must be regarded as higher than the corresponding one in Denmark and Norway, and is nearly the same as that now demanded in Germany. The apprenticeship is fixed at at least three years. After this he passes the "Minor," which is here called "farmaciestudiosi-examen," or "farmaciekandidat-examen." After 1881, this examination can be passed at "farmaceutiska institut" in Stockholm only. The requirements for the "Minor" are nearly the same as in Germany. The student must, as in Germany, present his "Laborationsjournal" at this examination.

He must now stay a year in a pharmacy as an assistant, and then he may go to Stockholm and enter the pharmaceutical institute. Having studied here for at least two years, he passes his "Major" ("Apotekareexamen") which is more severe than the Danish and Norwegian "Major," and is nearly the same as the corresponding German examination. This examination is fixed by a law of February 25, 1867, and having passed it the young man has the title of "Provisor och examinerad apotekare."

The pharmaceutical courses are thus somewhat higher in Sweden than

[1] "Finska läkaresällskapets handlingar." Adertonde bandet No. 1.—Helsingfors, 1876.

in the two other Scandinavian countries, and I suppose this fact especially is owing to the pharmaceutical institute in Stockholm, which has been active since 1837, while Denmark and Norway until this date lack such establishments.

Austria.

The following information respecting pharmaceutical study in Austria, I have partly collected myself while on a journey in that country (1879), and partly have obtained later from my friend Mr. P. Stolzissi, pharmaceutical chemist in Wailenkirchen, Ober-Oesterreich.

It is demanded by a law of June 14, 1859, that, as a "Preliminary examination," the candidate shall have passed "das Untergymnasium," *i. e.*, shall have attended the classical school for four years, and thus shall have learned Latin and Greek. After having been an apprentice ("Tyro," "Tiro," "Lehrling," or "Praktikant") for at least three years, he passes his "Minor" before the board of the "Gremium" of the province. The "Gremium" is a union of the pharmacists in the province, and of these "Apothekergremien" Austria possesses thirty-three. (Bavaria has also "Apothekergremien.")

The Austrian "Minor" is called "*Tyrocinialprüfung*" and corresponds very nearly to the German "Minor."

Having passed this examination, the young man is an assistant and must serve as such for two years in a pharmacy. Then he may commence his studies for the "Major" ("*die pharmaceutische Staatsprüfung*"). These studies are carried on at the universities for two years, on the following plan:

The first year; (1) Winter-semester: Physics, Mineralogy, Inorganic and Organic Chemistry—in each branch five hours of lectures a week. (2) Summer-semester: Zoology and Botany, each eight hours a week, Inorganic and Organic Chemistry, five hours a week. Then the examinations in Physics, Mineralogy, Zoology and Botany are held.

The second year: Pharmaceutical Chemistry, five hours a week, Materia Medica, three hours a week. Practical exercises in the chemical laboratory at least ten hours a week (qualitative, quantitative and forensic analyses). At the end of this year are first held the practical examinations (called "Magisteria,") and afterwards the theoretical examinations ("die Rigorosen") in Chemistry, Materia Medica and the pharmaceutical laws. At last he takes the pharmaceutical oath, and is now called "Magister der Pharmacie." Now, at length, he has the right to possess or manage a pharmacy.

If he wishes to be a "Doctor der Pharmacie," he must present "das Maturitätszeugniss," *i. e.*, a certificate that he has passed all the eight classes in the "Gymnasium," and that he has studied chemistry for a year after he has passed the "Major."

Want of space does not permit me to make these remarks so complete as I could have wished, but further information may be found in the very interesting essay of Mr. Th. Greenish, F.C.S., in Phar. Jour. and Trans. for May 4, 1872.

(To be continued.)

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, May 16, 1882.

The regular pharmaceutical meeting was held in the College hall, Alonzo Robbins in the chair, and William McIntyre acting Registrar.

Prof. Maisch, on behalf of the American Pharmaceutical Association, donated Vol. 29, Proceedings of their annual Meeting, 1881.

James T. Shinn read a paper prepared by A. H. Riise, of St. Thomas, W. I., on Bay Rum, and donated specimens of the leaves and fruit of Myrcia acris, oil of bay and distilled bay rum (see page 278). In the discussion on this paper this subject was said to be of importance from the little that had been published. Bay rum is hardly known on the continent of Europe, and 25 years ago its true origin was also unknown in this country. In a paper published in the "American Journal of Pharmacy," in 1861 (page 289), it was shown that bay rum was produced from Myrcia acris, the material for identifying the plant being a few leaves and branchlets, without flowers and fruit. Subsequently, the late Mr. Elias Durand ascertained, through one of his West Indian correspondents, that the plant had been correctly determined, but nothing was then known of the use of the fruit in this connection. That the volatile oil of this plant contained eugenol was known for some years, but this was first published by Prof. Markoe in 1877, who had made many interesting experiments with the volatile oil distilled by himself from the leaves, which proved its close chemical relation to the volatile oils of clove and pimenta. The composition accounts for the resemblance in odor; still there is a marked difference in this respect, fully as great as, for instanc, in those volatile oils which contain anisol, and the cause of this difference is as yet not known. Plants which are of near botanical relation are often of very similar chemical composition; yet in the volatile oils there is sometimes a wide difference, not merely in odor but in their constituents. Attention was drawn to the collection of volatile oils of different species of Eucalyptus which some years ago were presented to the College cabinet by Mr. Bosisto, of Melbourne, and of which one, obtained from *Eucalyptus persicifolia*, possesses not only an odor closely analogous to, but contains also the same chemical compounds which are found in the volatile oil of bitter almonds. It was suggested by Prof. Maisch that probably the volatile oils of several of the many West Indian myrtles might contain eugenol and have a more or less distinct allspice odor, but that others had most likely an entirely different composition, and that the many varieties of the bayberry tree, referred to in the paper of Mr. Riise, were really different species of the genera Pimenta, Myrcia and other Myrtaceæ.

Mr. Shinn showed four samples of commercial bay rum, of which the one made by Mr. Riise had the specific gravity ·9210, corresponding to 48½ per cent. by weight of alcohol, while the density of the others was ·9290, ·9325 and ·9380, equal to 44½, 43 and 40½ per cent. of alcohol. A specimen

of St. Croix rum had the specific gravity ·930 = 44 per cent. alcohol. The fragrance of these and similar spirits may be compared by first filling a clean test tube or small vial and then emptying it, after which the peculiar flavor and its permanence become more apparent.

A vote of thanks to Mr. A. H. Riise was passed, and the paper referred to the Publication Committee.

Dr. L. Wolff read a paper on *chlorinated oil* (see page 273), illustrated the chemical nature of the substitution compounds on the blackboard, and exhibited specimens of chlorinated oils, and of soap prepared from them. The thanks of the meeting were extended to Dr. Wolff, and the paper was referred to the Publication Committee.

During the discussion on this paper it was stated that commercial olive oil was frequently adulterated with cotton seed oil, and it was said that the latter was also mixed with lard oil, and that a reliable test for its presence was very desirable.

Dr. A. W. Miller spoke of a new and clumsy adulteration of *sassafras oil* with kerosene, detected by its odor and its insolubility in alcohol; a sample of the adulterated oil was exhibited.

Also a new *vermilion substitute*, free from mercury and of handsome appearance; it is said to be made from a fine specimen of orange mineral tinted with eosine.

On motion, the meeting adjourned.

WILLIAM MCINTYRE, *Registrar pro tem.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

CHICAGO COLLEGE OF PHARMACY.—The adjourned annual meeting was held in the Library of the College, May 2d. After the reading of the minutes of the semi-annual and of the special meetings of the College, President Bartlett read the annual address, in which he reviewed the work of the College for the past and made suggestions as to the future of the institution. Reports of the various standing committees were read—that of the Lecture Committee showing that the past session had been the most prosperous, the number of students having largely increased and the average proficiency having been unusually high.

The annual election was then held, in which the following officers were chosen: President, Prof. N. Gray Bartlett; Vice Presidents—Mr. George Buck and Prof. G. M. Hambright; Recording and Corresponding Secretary, Judson S. Jacobus; Treasurer, T. H. Patterson; Trustees—Messrs. H. Biroth, E. H. Sargent, Thos. Whitfield, J. H. Wilson, H. D. Garrison, J. C. Borcherdt, E. K. McPherson, F. H. Secord, R. H. Cowdry and J. L. T. Davison.

ST. LOUIS COLLEGE OF PHARMACY.—The Board of Trustees have re-elected the faculty of the last session: Dr. C. O. Curtman, chemistry;

Dr. O. A. Wall, materia medica and botany, and J. M. Good, Ph.G., pharmacy.

THE ALABAMA STATE PHARMACETICAL ASSOCIATION held its first annual meeting at the Gulf City Gun Club rooms, at Mobile, May 9th and 10th. Dr. Savage, in behalf of the Mobile County Pharmaceutical Society, extended a cordial welcome to the members and visitors. The annual address of President P. C. Candidus was replete with thoughtful suggestions and dwelt more especially upon the necessity of the enactment of a pharmacy law having in view the protection of the public against incompetent practitioners of pharmacy and against worthless and fraudulent medicines, and thereby elevating phsrmacy.

The draft of a pharmacy law was discussed and ordered to be presented to the Legislature at its next session.

The following officers were elected for the ensuing year: President, P. C. Candidus; Vice Presidents—J. T. Bradfield and J. B. Collier; Treasurer, Y. P. Newman; Secretary, S. W. Gillespie; Executive Committee—T. J. Savage, Mobile; E. P. Braun, Mobile; John L. Rison, Huntsville. Various committes were appointed, also delegates to the American Pharmaceutical Association, and the Association finally adjourned to meet next year in Selma, on the second Tuesday in May.

THE INDIANA STATE PHARMACEUTICAL ASSOCIATION was organized at Indianapolis, May 9th, the meeting being held in Masonic Hall, about 250 druggists being present. Mr. W. C. Buntin, of Terre Haute, was elected temporary chairman and Jos. R. Perry, temporary secretary. A Committee on Permanent Organization was appointed and subsequently reported a constitution and by-laws, which were discussed, amended and adopted, followed by the election of the following officers: President, George H. Andrews, of Muncie; Vice Presidents—Flor. C. Schmidt, of Evansville and Charles V. Eyle, of Warsaw; Secretary, Jos R. Perry, of Indianapolis; Treasurer, Emil Martin, of Indianapolis; Executive Committee—Jacob Baur, Terre Haute; John M. Hurty, Indianapolis, and David Helt, Lafayette.

A paper, comparing the drug store of thirty years ago with that of to-day, was read by Mr. Geo. W. Sloan, various standing committees and delegates to the American Pharmaceutical Association were appointed, and the Association finally adjourned May 10th, to hold its next meeting again at Indianapolis, Mr. John Lambert being elected Local Secretary.

The Association was visited and addressed by Hon. D. W. Grubbs, Mayor of Indianapolis, and Governor A. G. Porter, of Indiana.

THE LOUISIANA STATE PHARMACEUTICAL ASSOCIATION was organized by a convention of pharmacists and druggists which assembled at the

rooms of the Louisiana Medical Association in the University of Louisiana, in New Orleans, on Monday, April 24th. The meeting was called to order by Mr. F. Brooks, of Baton Rouge; Mr. J. T. Thibodeaux was elected President pro tempore and Hiland Flowers, of New Orleans, Secretary pro tempore. A committee, consisting of Messrs. F. M. Brooks, C. L. Keppler, A. K. Finlay, B. Lewis and S. Hiriart, was appointed to draft a constitution and by-laws, which were subsequently considered, somewhat amended and adopted. The following permanent officers were then elected: President, Dr. Jos. T. Thibodeaux; Vice Presidents—Alex. K. Finlay and Dr. F. M. Brooks; Recording Secretary, Hiland Flowers; Corresponding Secretary, Ben. Lewis; Treasurer, Jno. B. Lavigne.

Several telegrams and communications, commendatory of the objects of the new association, were received and read. About sixty members were present at the opening session, and about forty more were subsequently elected—among them Mrs. E Rudolf, who, it was stated, though refused admission into the Medical College of the University of Louisiana, had perfected herself through private instructions; she is, we believe, the first lady member of a State pharmaceutical association. Prof. P. W. Bedford, of New York, Prof. J. M. Maisch and Mr. Alonzo Robbins, of Philadelphia, were elected honorary members.

Various committees were appointed and the work to be done by them considered; among them was a committee on legislation, at whose suggestion a special meeting was called for Monday, May 15th, with the view of considering the draft of a pharmacy law to be presented to the Legislature at its meeting in the same month.

Invitations were extended to all physicians throughout the State to attend the meetings and have the privilege of the floor, and to the American Pharmaceutical Association for holding its meeting next year in New Orleans.

The President was called upon to interpret the words "every *pharmacist and druggist*, etc., shall be eligible to membership," as contained in Art. III of the Constitution, and decided that this referred to one person only; accordingly, as a pharmacist is a person that confines himself strictly to putting up prescriptions and dispensing drugs, and a druggist one who merely sells and handles them, a druggist, whether wholesale or retail, is not eligible for membership unless he possesses the qualification of being a pharmacist in addition.

After having been in session for three days, the Association adjourned. The next annual meeting will be held in New Orleans on the first Monday in April, 1883.

At the special meeting of May 15th, 45 members attended to consider the proposed pharmacy act reported by Mr. G. J. Mattingly in behalf of the Committee on Legislation. The various provisions were discussed seriatim and, after the acceptance of a few amendments, the report was adopted, ordered to be printed, and at once forwarded to each legislator at Baton Rouge. In the evening the members sat down to a complimentary dinner at Astredo's, at the West End, given in honor of the visiting members.

THE MASSACHUSETTS PHARMACEUTICAL ASSOCIATION was organized at Worcester, May 17th, about two hundred apothecaries having assembled in Horticultural Hall. Words of welcome were spoken by Mr. W. Bush, of the Worcester Pharmaceutical Association, and Mr. C. H. Price, President of the Middlesex County Pharmaceutical Association, was elected temporary chairman. A constitution and by-laws had been informally discussed the preceding evening and were now again considered, somewhat amended and adopted.

The following permanent officers were elected: President, S. A. D. Sheppard, of Boston; Vice Presidents—Wm. Bush, of Worcester, H. A. Estabrook, of Fitchburg, and F. T. Whiting, of Great Barrington; Permanent Secretary; J. W. Colcord, of Lynn; Treasurer, F. H. Butler, of Lowell. Standing committees on papers and queries, on trade, Executive Committee and Trustees on permanent fund, and delegates to the American and to the New York Pharmaceutical Association were elected. A committee of fifteen, representing different parts of the State, was appointed on the subject of legislation and instructed to advocate a stringent pharmacy law. To the same committee were referred the following preamble and resolution, offered by J. G. Forman, of Lynn:

"WHEREAS, Druggists and apothecaries are subject to much inconvenience and embarrassment in their legitimate business, under the existing license law, and in some towns and cities the heated contests of the extreme partisans of license and prohibition have resulted in the refusal to grant the sixth-class license to apothecaries, exposing them to the penalties of the law for sales as a medicine, even though made under the prescription of a physician;

"*Resolved*, That the Committee on Legislation be requested to represent this evil to the next Legislature of the Commonwealth, and to secure, if possible, the following amendment to the license law, as far as it relates to apothecaries: Chapter 100, section 2, amend so as to read 'Druggists and apothecaries may sell pure alcohol for medicinal, mechanical and chemical purposes; also, wines and other spirituous liquors when prescribed by a physician; they may also sell liquors of any kind, not to be drank on the premises, under a license of the fourth or sixth class hereinafter mentioned: *Provided, however*, That druggists shall not be subjected to the penalties for unlawful selling when the sale is made upon the prescription of a physician.'"

A resolution was offered by Mr. Canning, of Boston, declaring it as the sense of the Association that the wholesale dealers in drugs and patent medicines should take measures to protect the pharmacists by not selling to any except regular pharmacists.

The following papers were read during the meeting:

On the Pharmacopœia, by Mr. S. A. D. Sheppard, giving its history, commencing with the local pharmacopœia published in 1805 by the Massachusetts Medical Society, and its commentary, the dispensatory, by Dr. Jas. Thacher, of Plymouth, and following up the elaboration of the United States Pharmacopœia in 1820, and its various revisions to the present time, and referring to the influence upon these revisions by Drs. Wood and Bache, the authors of the United States Dispensatory.

On Alkaloids, by Prof. P. W. Bedford, describing their sources and processes of manufacture.

On Pepsin, by Mr. W. W. Bartlett, describing its mode of manufacture, the apparatus used and methods of assay.

By Mr. H. A. Estabrook, of Fitchburg, *On Fluid Extracts and Other Preparations*, made with the Rosenwasser percolator (see "Amer. Jour. Phar.," 1881, p. 567), with suggested improvements, illustrated with a glass model of a percolator. The process utilizes hydrostatic pressure and can be applied to rapid filtration.

On the Metric System of Weights and Measures, by Prof. G. F. H. Markoe, explaining its origin and relations, and illustrated by weights and apparatus.

During the meeting courtesies were exchanged, by telegraph, with the State pharmaceutical associations then in session, and the Association adjourned to hold its next annual meeting at Springfield on the third Tuesday of May, 1883, when, at the suggestion of the President, the members will be accompanied by ladies, so as to make the meeting a season of pleasure as well as profit.

THE NEW JERSEY PHARMACEUTICAL ASSOCIATION held its twelfth annual meeting in the City Hall at Atlantic City, May 17th and 18th, President Charles Holzhauer in the chair; A. P. Brown, Secretary. Addresses of welcome were made by Dr. W. Wright, Mayor of Atlantic City, and by Dr. Reed. In his annual address, the president made various timely suggestions, which were subsequently considered. The Treasurer reported a balance of $342.87 on hand, an increase of $73 over the preceding year's report. Reports were also read from the State Board of Pharmacy, showing the work done during the preceding year and the amount of money received, which was $369, and $38.50 in excess of the expenditures, the excess being paid over to the Association in conformity with the pharmacy law. The report also related the favorable result of a suit for enforcing this law, and the by-laws were subsequently modified, so as to render ineligible as members of the Association all those who have not complied with the pharmacy law.

A communication from a committee of the Pennsylvania Pharmaceutical Association, relative to the liquor license of pharmacists, was read and the resolution (see page 261) adopted and forwarded to Congress.

The following-named officers were elected for the ensuing year: President, Joseph P. Canby, Atlantic City; Vice Presidents—Joseph Bassett, Salem, and D. Wood Brant, Newark; Treasurer, William Rust, New Brunswick; Recording Secretary, A. P. Brown, Camden; Corresponding Secretary, R. W. Vandervoort, Newark; Standing Committee—Joseph Bassett, Thomas Combs, H. C. Thorn, Charles Holzhauer and Robert J. Shaw.

Obituary notices of members deceased during the past year were read and a picture of the late Charles H. Dalrymple was ordered to be procured. Professor J. P. Remington was elected an honorary member.

A resolution of sympathy was adopted with Mr. E. S. Reed, of Atlantic City, who had zealously worked for making this meeting a success, and was now prostrated by sickness.

Greetings by telegraph were received from several pharmaceutical associations in session, and were appropriately answered.

The following papers were read and referred for publication:

On the Ownership of Prescriptions. By Chas. B. Smith. The author maintained that the renewal of prescriptions could only be prevented by the physician informing the patient and making the written statement upon the prescription that it was to be compounded once only.

On Tincture of Capsicum. By G. W. Parisen. A stronger alcoholic menstruum than that ordered by the present Pharmacopœia was recommended.

On New Drugs and Remedies. By F. W. Kilmer. An able review, frequently humorous, of the remedies introduced and revived during the past ten years.

On an Excipient for Pill Masses. By G. W. Parisen. Glycerite of starch was recommended as a very useful one.

On Text Books and a Course of Instruction for Beginners. By H. P. Reynolds. While the well-known text-books were recommended, the author insisted on the personal instruction of the apprentice by the employer as a duty.

On the Use of the Microscope in Pharmacy. By A. P. Brown. The author showed the usefulness of the microscope in the examination of drugs for their identity and purity, and in the analysis of urine and other matters.

On the Condition of Pharmacy. By D. W. Brant. Various matters of general and local interest were discussed by the author.

The subject of a suitable *substitute for vaselin* and similar *soft paraffins* was discussed by Chas. Holzhauer, who found a mixture of good paraffin oil with wax answering the purpose.

The question concerning the *use of specialties* manufactured on the large scale created considerable discussion, it being maintained on the one side that the prescribing of such pharmaceutical novelties of manufacturers by physicians was improper; that it was the duty of the pharmacist to prepare the pharmacopœial galenicals, to cultivate his skill for compounding medicines in all possible forms, and to teach his apprentices and assistants in the same direction. On the other hand, representatives of manufacturers contended that at least some of these specialties could be made more accurately and handsomer by the use of machinery constructed for the purpose.

Resolutions were adopted favoring the abolition of stamp duties on matches, bank checks, medicines and perfumery.

The next annual meeting will be held at Orange, and Mr. G. J. Seabury was appointed Local Secretary.

On the evening of May 17th a microscopical exhibition was given at the Ocean House, and proved to be very attractive and interesting. An excursion was tendered by the Camden and Atlantic Railroad to the members

and visitors to South Atlantic City, where the curious structure of the Elephant Hotel formed the chief attraction, a building having the shape of a huge elephant, 86 feet long and 65 feet high, which has been erected there, on the beach, facing the Atlantic Ocean.

THE OHIO STATE PHARMACEUTICAL ASSOCIATION held its fourth annual meeting in Gold Hall, Zanesville, May 17th, President I. N. Reed in the chair; L. C. Hopp, Secretary. Dr. D. C. Peters addressed words of welcome to the visitors, and various invitations from manufacturers were received to visit their establishments. A delegation from the Pennsylva-Pharmaceutical Association was present and presented the action had in regard to the liquor dealers' license (see page 261). After a lengthy discussion, a resolution was adopted favoring the proposed plan and ordering its being communicated to the representatives of Ohio in Congress.

In his annual address, the President alluded to many subjects of local and general interest, taking a decided stand against patent medicines and trade mark compounds, concluding his remarks on this subject with the statement that the removal of the stamp tax was not of interest to pharmacists financially, and with picturing the evil effects upon pharmacy and science in general, not the least of which is the endorsement by some chemists and physicians of no mean fame or intelligence of compounds which a trade mark or patent prohibit any but the owner from manufacturing. The pharmacist, he argued, may with propriety recommend, in fair terms, his own compounds, and, like Scheffer with his pepsin, freely give it to the scientific world, thus inlaying his action with the jewels of of love for his profession.

The reports of the Secretary, Treasurer and Executive Committee were read, all showing gratifying results. The salary of the Secretary was fixed at $100 per annum.

The election of officers for the ensuing year resulted as follows: President, Dr. D. C. Peters, Zanesville; Vice Presidents—E. A. Schellentraeyer, Cleveland, and F. Harrington, Logan; Permanent Secretary, L. C. Hopp, Cleveland; Permanent Treasurer, Chas. Huston, Columbus.

The various standing and several special committees were appointed, and delegates were elected to attend the meetings of the Pennsylvania and of the American Pharmaceutical Association. The membership was increased by 156 new members, and Dr. E. R. Squibb, Profs. E. S. Wayne and J. M. Maisch were elected honorary members. Akron was selected as the place for holding the next annual meeting, but the vote was subsequently reconsidered, on the ground that the hotel facilities were insufficient for accommodating the members, and Cleveland was selected.

Greetings were interchanged, by telegraph, with several State associations in session, and several papers were read, of which, however, the titles have not been received.

The fourth session, held on Thursday morning, May 18th, was mainly devoted to the consideration of a pharmacy bill, prepared by a committee, of which J. A. Nipgen, of Chillicothe, was chairman. The bill, which is almost identical with the Cincinnati pharmacy law, was amended so as to

apply to venders of drugs, chemicals, etc., for "medicinal purposes." Considerable discussion was had on the section making the officers and teachers of schools or colleges of pharmacy ineligible as members of the pharmaceutical examining board, and the association by a decided vote refused to strike out this clause. The bill will be presented to the Legislature next winter, with a petition for its passage, by a committee appointed for the purpose, and another committee was charged with making nominations for the pharmacy board in case the bill should become a law.

The association then adjourned.

THE VIRGINIA STATE PHARMACEUTICAL ASSOCIATION held its first annual meeting in the city of Richmond, in the hall of the House of Delegates, May 16th and 17th. Hon. W. C. Carrington, Mayor, welcomed the members in a brief but appropriate speech. President T. R. Baker delivered his annual address, making many valuable suggestions. Reports were received from the Secretary and from the Committee on Legislation, the latter stating that the effort to have a pharmacy law passed had failed. The bill was afterwards considered by sections, slightly amended, and endorsed for presentation to the Legislature at its next sessions.

Greetings, by telegraph, were exchanged with several State pharmaceutical associations then in session. Several amendments to the by-laws were proposed for consideration at the next meeting, a number of members were elected and various committees appointed. Papers were read by Mr. Thomas, of Norfolk, on "the toxic properties of potassium chlorate," and by Mr. Purcell on "the duties of an apothecary in the olden time (sixteenth century)." Norfolk was selected as the place for holding the next annual meeting.

After adjournment the Richmond pharmacists entertained the visiting members at a banquet, at Saenger-Halle.

PHARMACY LAW IN WEST VIRGINIA.—The law passed Feb. 21, 1881, has been amended and re-enacted, March 25, 1882, the State Board of Pharmacy being composed of one pharmacist from each Congressional district, namely, Edmund Bocking, of Wheeling, Secretary and Treasurer; J. L. W. Baker, of Martinsburg; E. L. Boggs, of Charleston, President, and A. N. Williams, of Parkersburg, Vice-President.

PHARMACY LAW IN WISCONSIN.—A pharmacy act was approved by the Governor March 24th, which entrusts the Wisconsin Pharmaceutical Association with nominating the candidates from whom the Governor appoints the State Board of Pharmacy. The first board is constituted as follows: T. H. Spence, of La Crosse, President; A. H. Hollister, of Madison; F. Robinson, of Kenosha; A. Conrath, of Milwaukee, and E. B. Heimstreet, of Janesville, Secretary.

THE ST. JOSEPH, MO., PHARMACEUTICAL ASSOCIATION was organized April 12th; a constitution and by-laws were adopted and the following officers chosen: President, Wm. Striblen; Vice-President, Thomas H.

Elfred; Secretary, Eugene Soper; Treasurer, Geo. E. Coulter. It is intended to hold meetings on the evenings of the first and third Tuesday of each month.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—At the pharmaceutical meeting held March 1st, President Greenish in the chair, Mr. Holmes called attention to a soft Columbian bark, which Mr. Howard had informed him was likely to enter into commerce in large quantities, and which yielded 1·56 per cent. quinine sulphate, 1·55 cinchonidine sulphate, and 0·25 cinchonine. The bark was reddish, had a coarse fibre, and the leaves accompanying it were minutely wrinkled. The variety *oblonga* of *Cinchona lancifolia*, described by Howard in 1873, had a yellowish bark, less coarsely fibrous, and the leaves were smooth.

The bark of *Rauwolfia glabra* is used in Natal, under the name of *bitterboom*, as a substitute for cinchona in the treatment of fevers; and an aromatic bark called *capoche bark* is said to be produced from a scarce tree, and used in Belize for fevers, etc.

Mr. Martindale called attention to a test recently devised by Mr. Yvon for the *purity of chloroform*, and consisting in a strongly alkaline solution of potassium permanganate (1 part permanganate, 10 parts potassa and 250 parts water), which in contact with the chloroform should retain its violet color for ten minutes. Four samples prepared from methylated spirit, two from pure spirit, and one from chloral, would not stand this test; ether and alcohol, as well as other impurities, would cause a reduction, and prolonged action of the alkaline liquid upon chloroform would break it up into potassium formate and chloride. On purifying it with this test, the chloroform was free from disagreeable odor, and on evaporation left no amylic alcohol impurity.

Professor Redwood observed that at the time when the additions to the British Pharmacopœia were under consideration, Professor Christison had suggested that the cause of the change in chloroform was an impurity, probably nitric acid, in the oil of vitriol used in the purification. Prof. Redwood had satisfied himself that the presence of a very small quantity of nitric acid in the oil of vitriol used would, in a short space of time, produce decomposition; this fact seemed to have been recognized by manufacturers, and chloroform now supplied was less liable to change. He doubted the necessity of adding a little alcohol to the chloroform in order to preserve it. The importance of the subject could not be overestimated so far as regarded chloroform to be used for anæsthetic purposes.

A paper by Mr. J. C. Thresh was read on *the constituents of Zingiber officinale*, augmenting his investigations made in 1879 (see "Amer. Jour. Phar.," 1879, p. 519). The neutral resin has the empirical formula $C_{16}H_{24}O_3$, and is slowly acted upon by melted potassa, yielding most probably protocatechuic acid. The acid resins were separated by fractional precipitation with basic lead acetate. Resin α is hard, brittle, jet-black, has the composition $C_{46}H_{54}O_{10}$, yields amorphous compounds with bases, and on fusion with potassa an acid reacting with ferric chloride like protocatechuic acid. Resin β is red-brown, so soft as to be easily indented by

the nail, but breaks with a resinous fracture, and has probably the composition $C_{43}H_{58}O_8$. The straw-colored oil, having a slightly aromatic odor and a bitter, somewhat pungent taste, is probably a hydrocarbon polymeric with terpene. The active principle gingerol is so susceptible of change, by action of heat and the various substances employed in isolating it, that it is almost impossible as yet to feel assured of its purity.

A note on *extract of aconite and on the alkaloid of Aconitum paniculatum*, by E. L. Cleaver and M. W. Williams, corroborated the fact, previously stated by Mr. Holmes, that the plant mentioned is to a certain extent used for the preparation of extract. This extract is dark green, firm, of a slightly bitter taste, and without the peculiar aftertaste produced by *Aconitum Napellus*. The extract of the latter was dark brown, much more hygroscopic, and, when a small quantity was taken, produced the characteristic tingling, etc. The flowers of *A. paniculatum* yielded ·9 per cent., the leaves ·1 per cent. and the extract ·3 per cent. of a non-crystalline alkaloid having a very bitter taste, free from tingling, and which may probably be identical with picraconitine.

In the discussion upon this paper it was stated that from 1836 to 1851 the last-named plant was recognized by the London and Dublin Pharmacopœias, having been adopted in the belief that it was the plant employed by Stoerck in 1764. It was als stated that *Aconitum ferox*, formerly exported from Hindostan, had not been sent to the London market for about fifteen years, that German aconite root was probably not solely derived from *A. Napellus*, and that the market was at times glutted with Japanese aconite root from *A. Fischeri*. While it would be very desirable to standardize such important drugs, the difficulty in the way is the impossibility as yet of assaying for aconitine, and not for total alkaloids, including possibly quite inactive alkaloids.

EDITORIAL DEPARTMENT.

REPORTS ON THE PROGRESS OF PHARMACY.—With the increase of scientific investigations since the beginning of the present century, and more particularly during the past thirty or forty years, the publications in all departments of science have increased to such an extent that it is very difficult to remain conversant with all the facts which have been elucidated in any one branch of theoretical or applied science. The field for investigation is practically unlimited, and the investigators being continually on the increase, it is obvious that the difficulty referred to must become greater instead of decreasing. This fact is so well known and so thoroughly recognized, that at the present time, reports are being published, at stated intervals, giving a synopsis of the various publications, covering a certain field, which have been published during such a period. Some of the most valuable of such reports even find it impossible to give abstracts, but have to confine themselves to classifying the literature and merely indexing it, so as to facilitate the researches on any special subject. Of the lattter

class is the "Index Medicus," to the intrinsic value of which we have repeatedly directed attention since its publication was commenced in 1879. The necessity for such reports has become so pressing that, at present, the literature of all or nearly all sciences, and very often of more limited branches thereof, are thus rendered more readily accessible than they otherwise would be, and that most of the journals devote more or less space not merely to the republication of selected essays from other journals but to the condensation of most of them in some form or other.

Reports on subjects connected with pharmacy, covering as much as possible the literature of all countries, were commenced at an early date. In order to be of the greatest possible value, such reports should not merely be a collection of abstracts without obvious systematic arrangement, but they should be properly classified. Among the earlier ones may more particularly be mentioned those published since 1819 in "Buchner's Repertorium," which were devoted to chemistry and more especially to pharmaceutical chemistry. An annual report known as "Canstatt's Jahresbericht," commenced to appear in Germany in 1840, embracing all branches of medical science, including pharmacognosy and pharmacy, the reports on these latter having been prepared since 1844 by the late Professor Wiggers, and attained well-merited recognition for thoroughness and completeness, throughout the pharmaceutical world. Since 1866 this "Jahresbericht," embracing pharmacognosy, pharmacy and toxicology, is published as a distinct work and is now edited by Professor Dragendorff, its fame as a reliable repository of investigations made in the departments mentioned, in all parts of the world, is well established and unquestioned.

These reports being printed in the German language are, of course, inaccessible to those not conversant with that tongue; but the necessity of such an annual compendium, regularly issued, was deeply felt both in Great Britain and the United States, and in the former country the want was supplied by the British Pharmaceutical Conference, by which body the "Yearbook of Pharmacy" is published since 1870.

In the United States, the late Prof. Procter, in 1855, pointed out the desirability of preparing such a report regularly, so as to be accessible to American pharmacists, and in that year a committee was appointed by the American Pharmaceutical Association, consisting of Edward Parrish, Samuel M. Colcord and James S. Aspinwall, whose report included a provision for the appointment of a Committee on the Progress of Pharmacy, and was adopted in 1856. The first chairman of this committee was Prof. Procter, who in the following year made the first report, covering 30 printed pages, and based mainly on the publications in the English, and to a certain extent in the French language. Since that time this report has been published annually, with the exception of 1871–72, and was prepared by different members, well known to American pharmacists. About twenty years ago the report became so voluminous, and its preparation involved such an amount of labor, that it soon became evident that the plan of preparing it would have to be changed, and in 1873 lhe committee was abolished and its place taken by a Reporter on the Progress of Pharmacy, to which position Prof. C. L. Diehl was elected, who had pre-

viously prepared this important report for three years. Of the quality of his reports it is not necessary to speak, since all who read the annual Proceedings of the American Pharmaceutical Association, of which publication it forms a most important part, accord to its merits due praise.

We have thought it proper to give the above brief historical sketch, which will, we think, fully explain the words of caution that we feel are due to a project evidently not weighed in all its bearings. We refer to reports on the progress of pharmacy by some of the State Pharmaceutical Associations. Such reports have heretofore been made to several of these organizations, and those who have taken occasion to examine them and compare them with any of those mentioned above, will readily concede that though they may be—as some of them really are—valuable collections of abstracts as far as they go, yet that they are necessarily meagre, not in the least approaching in completeness the former, and consequently *as* reports on the progress of pharmacy, of no utility. Such reports *must* embrace the literature of nearly all countries, and to prepare them properly is a task which requires not only intelligence but also a special training and peculiar aptitude, qualities which are not too commonly found.

Moreover, such a report acquires its commensurate importance only through the circle of its readers, and instead of leading the energies producing it into a multitude of channels, each a weak one, it is by far better to concentrate the efforts upon one common object, thus insuring not only its vitality, but also increasing its efficiency and usefulness. There is no more reason for a State association than for a county society or for an individual, to prepare a report on the progress of pharmacy; on the contrary, all reputable pharmacists throughout the country should consider it a duty to further the usefulness of one of the most valuable publications of its kind by consulting it.

Much more might be said on this subject, but we consider the above as amply sufficient to prove the futile character of such divided labors; and while, on the one hand, we hope that the practice of preparing such reports, where it still exists, may soon be abandoned, we sincerely trust that it may not be undertaken in other State associations, where its introduction has been recently recommended.

OBITUARY.

Professor JOSEPH DECAISNE, the eminent botanist, died at Paris February 8th last, having nearly completed his seventy-fifth year. He was born at Brussels, and while quite young came to the Jardin des Plantes as gardener. He wrote the monographs on Asclepiadaceæ and Plantaginaceæ for DeCandolle's Prodromus, was editor of the "Annales des Sciences Naturelles" since 1842, and published numerous essays and several works on botany, of which the Traité général de Botanique, written in conjunction with Le Mouat in 1868, has particularly attracted the attention of botanists. For many years he was Director of the Jardin des Plantes and Professor at the Museum of Natural History at Paris.